SUFFOLK COUNTY BAUMANN BUS SITE
AIRPORT DEVELOPMENT DISTRICT
GABRESKI AIRPORT, WESTHAMPTON BEACH, NY
SITE: #V-00576-1

SUPPLEMENTAL INVESTIGATION WORK PLAN

Submitted To:

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TABLE OF CONTENTS

1.0 INTRODUCTION AND PURPOSE 1

2.0 SITE DESCRIPTION AND HISTORY 2

2.1 Site Description 2
2.2 Site History 2
2.3 Site Hydrogeology 4
2.4 Site Features 4
2.5 Current and Future Site Use 5
2.5.1 Surrounding Site Uses 5

3.0 STANDARDS, CRITERIA, AND GUIDANCE (SCGS) 6

4.0 OBJECTIVES, SCOPE AND RATIONALE 7

4.1 LNAPL/VOC Plume 7
4.1.1 Vertical Delineation 7
4.1.2 Horizontal Delineation 8
4.1.3 Groundwater Sampling 8
4.2 Storm Drains and Sanitary Cesspools 9
4.3 Oil-Water Separator/Leaching Pit 9
4.3.1 Oil-water Separator/Leaching Pit Soil Excavation 10
4.4 Soil Vapor Sampling 11
4.5 Site Survey 11
5.1 Project Organization 12
5.2 Laboratory Analysis 12
5.2.1 Soil Samples 12
5.2.2 Groundwater Samples 13
5.2.3 UIC Samples 13
5.2.4 Soil Gas Samples 14
5.3 Field/Laboratory Data Control Requirements 14
5.4 Sample Identification 15
5.5 Chain-of-Custody, Sample Packaging and Shipment 16
5.6 Data Validation 16
5.6.1 Data Validation Requirements 16
5.6.2 Data Validation Methods 16
5.7 Field Equipment Calibration 16
5.8 Equipment Decontamination 17
5.8.1 General Procedures 17
5.8.2 Heavy Equipment 17
5.8.3 Sampling Equipment 17
5.8.4 Meters and Probes 17
5.9 Waste Management 17
5.9.1 Management of Investigation Derived Waste 18
5.9.2 Management of UIC Waste 18
5.9.3 Management of Petroleum Contaminated Soil 18
5.10 Field Documentation 19

6.0 SUPPLEMENTAL INVESTIGATION REPORT PREPARATION 20

6.1 Supplemental Investigation Schedule 20

7.0 HEALTH AND SAFETY 22

8.0 COMMUNITY AIR MONITORING PLAN 23

TABLES

Table 1	Historical Soil Analytical Data Summary (follows text)
Table 2	Historical Groundwater Analytical Data Summary (follows text)
Table 3	Historic Water level and LNAPL Measurements
Table 4	NYSDEC Soil Cleanup Objectives for VOCs (follows text)
Table 5	NYSDEC Soil Cleanup Objectives for SVOCs (follows text)
Table 6	Groundwater Standards for VOCs and SVOCs (follows text)
Table 7	SCDHS UIC Action Levels and Cleanup Objectives
Table 8	USEPA Target Soil Gas Concentrations for VOCs
Table 9	Analytical Methods (Soil) (located on page 13)
Table 10	Analytical Methods (Groundwater) (located on page 13)
Table 11	Analytical Methods (sediment/sludge) (located on Page 14)
Table 12	Analytical Methods (Soil Gas) (located on Page 14)
Table 13	Field/laboratory QC Requirements (located on page 14)
Table 14	Estimated Number of Soil and Groundwater Samples (located on page 15
Table 15	Project Schedule (located on page 21)

FIGURES

Figure 1	Vicinity Map
Figure 2	Airport Development District Boundaries
Figure 3	Historic Sampling Locations
Figure 4	0.5 Mile Radius Map
Figure 5	Public Drinking Water Supply Wells
Figure 6	Proposed Sampling Locations (Oil-Water Separator/Plume Delineation)
Figure 7	Possible Sampling Locations (Storm Drains and Sanitary Cesspools)
Figure 8	Organizational Flow Chart
Figure 9	Typical Stockpile Construction Detail

APPENDICES

Appendix A	Water Level and LNAPL Graphs
Appendix B	Site Photographs
Appendix C	SCDHS – Standard Operating Procedure (SOP) 9-95, Pumpout and Soil Cleanup Criteria and Certificate of Sewage Disposal System Abandonment Form
Appendix D	Low-Flow Purging and Sampling Procedure
Appendix E	Health and Safety Plan
Appendix F	Community Air Monitoring Plan

1.0 INTRODUCTION AND PURPOSE

The former Baumann Bus site is located within the Airport Development District (ADD) at the Francis S. Gabreski Airport in Westhampton Beach, New York (Suffolk County Tax Map Number 900-312-1-1). The property is owned by Suffolk County and managed by the Department of Economic Development and Workforce Housing. A Vicinity Map is included as **Figure 1**.

The purpose of this work plan is to outline procedures and a scope of work intended to: determine the vertical and horizontal extent of soil and groundwater impacted with volatile organic compounds (VOCs) and/or Light Non-Aqueous Phase Liquids (LNAPL) in the vicinity of the former Baumann Bus site (former Building 140) as required in the Remedial Action Work Plan (RAWP) prepared by O'Brian & Gere Engineers, Inc. for Rebuild NOW-NY, to characterize and remediate underground injection control structures in accordance with the RAWP utilizing Suffolk County Department of Health Services (SCDHS) Standard Operation Procedure (SOP) 9-95, *Pumpout and Soil Cleanup Criteria*, collect soil gas samples, delineate soil contamination associated with a former suspect oil/water separator (discussed in an October 4, 2007 letter to the NYSDEC from the SCDHS), and to perform limited soil excavation if the suspect oil/water separator is identified as a potential source of groundwater contamination at the site.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Francis S. Gabreski Airport is located on County Road 31 in the Town of Southampton, New York and is owned by Suffolk County. The airport is located within the Long Island Pine Barrens which are characterized by open, sunlit woodlands dominated by pitch pine interspersed with white and scarlet oak. The nearby Quogue Wildlife Refuge is characterized by dwarf pitch pines ranging from 3 to 6 ft tall. The airport itself is characterized by surrounding wooded areas consisting of 25 ft pitch pines and scattered scrub oak. The Airport has no commercially scheduled service, but does support private planes and presently is the home of the 106th Rescue Wing of the New York Air National Guard (NYANG).

The Airport Development District (ADD) encompasses 58.6 acres of the Airport. The ADD is bounded to the north by the Airport service road, to the south by Cook Street, to the east by Sheldon Avenue and to the west by County Road 31. ADD Boundaries are illustrated in **Figure 2**.

The area of concern within the ADD is the former Baumann Bus site, located at the former location of Building 140 at the northwest corner of Avenue B and Cook Street (**Figure 2**).

2.2 Site History

In 1943, the Federal government built the airport for use as an Air Force base during World War II. After the war, it was returned to Suffolk County. In 1951 it was reclaimed for the Korean War National Emergency. In 1960, it was leased by the US Air Force for an Air Defense Command Base, deactivated in 1969, then released back to Suffolk County in 1970.

The ADD portion of the Airport was occupied by housing for base personnel, a theater, church and PX, as wells as buildings for training and support services, including a photo lab, vehicle repair areas, flight simulator and armament and electronics storage facility. Several storage tanks, used to store fuel-oil, gasoline and diesel, were located at the site. One tank was reportedly used for the temporary storage of jet fuel while aircraft were undergoing repair. Storage tanks at the site were reportedly removed prior to 1990.

Suffolk County conducted investigations in the vicinity of the southern part of the ADD parcel (between Smith and Avenue B) in connection with discovery of a plume containing a light non-aqueous phase liquid (LNAPL). A groundwater monitoring program was subsequently initiated to define the extent of impacted ground water. LNAPL was observed to be present on the groundwater table in several wells installed in the area between February and September 1986. Two recovery wells were subsequently installed at the leading edge of the plume and an air-stripping tower was constructed. The groundwater extraction and treatment system reportedly operated for several years and little LNAPL was recovered. Operation of the treatment system was terminated in 1990.

The investigation of the ADD and the development of a Remedial Action Work Plan (RAWP) were completed under the Empire State Development's (ESD) "ReBuild - Now New York" program. This collaborative effort between ESD and the NYSDEC was created to identify, prepare, and market parcels of land throughout New York State that are well-suited for economic development. The project was carried out under the requirements of the New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Program. Under the ReBuild program, more extensive sampling of the ADD was conducted from June to July 2002 and during September 2002. The findings of these studies are presented in the Site Investigation Report (SIR) prepared by O'Brien & Gere Engineers, Inc. (O&BG) dated February 2004. A RAWP was completed by O&BG in June 2004.

Site investigation Report

The SIR identified various volatile and semi-volatile organic compounds (VOCS and SVOCs) in subsurface soils and groundwater in the vicinity of the former Baumann Bus site. The LNAPLS/VOC plume appears to be limited to an approximately 70 foot by 170 foot area within the ADD; dissolved VOCs appear to have migrated onto the adjacent NYANG property. Historical soil and groundwater analytical data are summarized in **Table 1** and **Table 2**.

The SIR also identified one manhole located in the northern portion of the site which was found to contain a minor amount of residual solids impacted with SVOCs. The other subsurface structures used for discharge of stormwater and/or sanitary water were not sampled as part of the SIR.

Remedial Action Work Plan

A RAWP was completed for the site in June 2004. The RAWP established "*guidelines for management of materials removed form the LNAPL/VOC plume area and the subsurface structures including manholes and cesspools prior to and during remedial activities*".

The selected remedy detailed in the RAWP includes:

- Closure of unused subsurface sanitary structures in accordance with Article 12 of the Suffolk County Sanitary Code, Standard Operating Procedure 9-95 - Pumpout and Soil Cleanup Criteria, and Suffolk County "*Guidelines for Equipment and Procedures for the Remediation of Contaminated Leaching Pools*", and
- Removal of petroleum impacted soil by excavation.

Recent Site Activities

Suffolk County has completed demolition of the majority of the buildings located in the ADD.

During demolition of Building 140 in August 2007, an oil/water separator was discovered within the building. The SCDHS described the oil/water separator as an upside down septic tank with open manhole covers on the

bottom allowing for discharge directly to the subsurface. Based on the prior usage of the building as an automotive repair facility, the oil/water separator may have been a source of subsurface soil and/or groundwater impact. Cesspools and storm drains associated with the Building 140 at the former Baumann Bus site were sampled by the SCDHS and found to be uncontaminated.

2.3 Site Hydrogeology

The hydrogeology of Suffolk County, Long Island, consists generally of a seaward-thickening wedge of Cretaceous sedimentary strata, forming three aquifers, on top of a southeast-dipping impermeable basement of Precambrian crystalline bedrock. The sedimentary strata in ascending order are the Lloyd Aquifer, the Raritan Clay, Magothy Aquifer and at the ground surface, the Upper Glacial Aquifer. Together, these three water-bearing zones form Long Island's sole source aquifer system.

The aquifer of concern at the Baumann Bus site is the Upper Glacial Aquifer which is an unconsolidated mixture of sand and gravel. The approximate thickness of the Upper Glacial Aquifer in Suffolk County is 100 feet with an estimated average horizontal hydraulic conductivity (permeability) of 270 feet/day and a vertical hydraulic conductivity of 27 feet/day.

Clay layers, such as the Gardiners Clay and the "20 Foot Clay," where present, may act as local confining units, separating the Upper Glacial Aquifer from the underlying Magothy Aquifer which is the principal source of drinking water in Suffolk County.

During the sampling program performed by OB&G depth to groundwater ranged from 32 to 46 feet below ground surface and a confining unit (clay) was not present at the drilling depths performed. Regional groundwater flow at the site is to the southeast.

Historic sampling locations are illustrated in **Figure 3.** Historic water level and LNAPL measurements are summarized on **Table 3**; and the approximate location of the LNAPL/VOC plume are illustrated in **Figure 3**. Graphical representations of groundwater elevations (in feet below land surface) and LNAPL thickness are provided in **Appendix A.** As can be seen on the graphs, groundwater elevations at the site fluctuate from approximately 30 to 36 feet below ground surface (bgs). In monitoring wells from which measurable quantities of LNAPL have historically been present, it can be seen that the LNAPL generally occurs during the time when the depth to groundwater approaches 35 feet. Indicating the LNAPL is trapped, in saturated pore space, beneath the groundwater table for extended periods of time. During the monitoring event conducted on January 18, 2008, one monitoring well showed measurable quantities of LNAPL, 0.16 feet in PZ-08.

2.4 Site Features

PWGC performed an inspection of the site on January 18, 2008. The majority of the site is unpaved and consists of uncapped soil. The former location of the oil-water separator was covered with plastic sheeting. Several previously existing piezometers appear to have been destroyed or damaged during demolition of Building 140.

The site is located approximately 50 feet above mean sea level. The topography of the site is generally level except for a former recharge basin to the west of the former location of Bldg. 140. This recharge basin received discharge from the groundwater treatment system discussed in Section 2.2. Much of the ground surface is paved roadway or parking areas. Precipitation at the southern end of the site and in paved areas flows into storm drains located along Cook Street and Avenue B. Photographs of the recent site inspection are included in **Appendix B**.

The nearest surface water body is Beaverdam Pond, located approximately 1.25 mile southwest of the site.

2.5 Current and Future Site Use

The site is currently unimproved and vacant. Proposed future plans for the site include redevelopment and use for commercial and/or industrial purposes.

2.5.1 Surrounding Site Uses

The ADD is bordered to the north by undeveloped Pine Barrens, to the south by the NYANG base and to the west by County Road 31, along which are several light industrial and commercial properties. Airport runways are located adjacent to the ADD to the east. Beyond the runways to the east is the Quogue Wildlife Refuge, which is separated from the Airport by a small wooded buffer area.

The nearest residential properties are located approximately 1 mile west and south of the site. Residential areas in the vicinity of the site are connected to the municipal water supply provided by the Suffolk County Water Authority (SCWA). Several SCWA municipal supply wells are located in the vicinity of the airport. The area surrounding the site is illustrated in **Figure 4**; municipal water supply well field locations are illustrated in **Figure 5**.

3.0 STANDARDS, CRITERIA, AND GUIDANCE (SCGS)

Based on the January 2004 SIR and June 2004 RAWP, the following contaminants of potential concern (COPCs) have been identified:

- VOCs (petroleum related)
- SVOCs (Petroleum related), and
- Metals

The NYSDEC Technical Administrative and Guidance Memorandum (TAGM) 4046 established recommended soil cleanup objectives (RSCOs) for use in restoring inactive hazardous waste sites to predisposal conditions.

NYSDEC 6 NYCRR Part 375 provides soil cleanup objectives based upon future site use. In addition, Track 3 (restricted use with modified soil cleanup objectives) and Track 4 (restricted use with site-specific cleanup objectives) cleanup options can include complete removal of contaminated soils using site specific soil objectives, partial removal with surface capping, in situ treatment, and Institutional Controls and/or Engineering Controls to prevent exposure.

Groundwater sample results will be compared to the NYSDEC Class GA Ambient Water Quality Standards (AWQS) as specified in the Technical Operation and Guidance Series (TOGS 1.1.1) guidance document.

Tables 4 and **5** summarize the identified soil cleanup objectives for VOCs and SVOCs; **Table 6** identifies the NYSDEC groundwater standards for VOCs and SVOCs.

Article 12 of the Suffolk County Sanitary Code describes requirements for characterization and closure of underground injection control (UIC) structures. UICs include both sanitary and storm water control systems. Details of the characterization and remediation of UICs is included in Standard Operation Procedure (SOP) 9-95, Pumpout and Soil Cleanup Criteria (**Appendix C**). Action levels and cleanup objectives are summarized on **Table 7**.

Soil vapor sampling will be performed to screen for the presence of VOCs in shallow soils. Sampling will be performed in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006. Results will be compared to the USEPA Target Shallow Soil Gas Concentrations, Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance) Table 2b. Target Soil Gas concentrations for VOCs are summarized in **Table 8**.

4.0 OBJECTIVES, SCOPE AND RATIONALE

The objective of this work plan is to; define the vertical and horizontal extent of soil and groundwater contamination in the vicinity of Building 140 as required in the approved RAWP, characterization and remediation of former site stormwater control and sanitary structures (UICs), further investigate the oil-water separator/leaching pit identified within Building 140, and perform limited soil excavation in the vicinity of the oil-water separator/leaching pit if it is determined to be a continuing source to groundwater contamination.

The Scope of Work includes the following tasks:

1. Delineation of the vertical and horizontal extent of the LNAPL/VOC plume,
2. Characterization and remediation (if required) of sediments in storm drain catch basins and drywells, and sanitary cesspools (UICs),
3. Investigation of the oil-water separator/leaching pit identified within Building 140 and source removal (if required),
4. Soil vapor investigation,
5. Supplemental Investigation and Delineation Report Preparation

Proposed soil, groundwater, soil gas and UIC sampling locations are illustrated in **Figure 6** and **Figure 7**.

4.1 LNAPL/VOC Plume

Due to incomplete and/or out of date data regarding the precise location and extent of the LNAPL/VOC plume, soil borings will be installed within and around the estimated plume location to quantify the vertical and horizontal extent of subsurface impact.

4.1.1 Vertical Delineation

To assess the vertical extent of LNAPL/VOC impact, three soil borings will be installed along the approximate centerline of the plume.

Soil borings will be installed utilizing a Geoprobe® direct-push drill rig outfitted with a macro-core sampler and dedicated acetate sample liners. Soils will be collected continuously from ground surface to at least 5 feet below the deepest impacted interval (as determined by field observations) but not less than 36 feet below ground surface (bgs). Soils will be field screened for the presence of VOCs using a photo-ionization detector (PID).

At each boring location, one soil sample will be collected from the interval exhibiting the highest PID response and two additional samples shall be collected from intervals below the deepest impacted interval. If no PID response above background concentrations is observed, a sample will be collected from the interval immediately above the water table.

Groundwater samples will be collected from each of the borings as described in section 4.1.3.

4.1.2 Horizontal Delineation

To assess the horizontal extent of LNAPL/VOC impact, a minimum of ten soil borings will be installed around the approximate perimeter of the plume.

Soil borings will be installed utilizing a Geoprobe® direct-push drill rig outfitted with a macro-core sampler and dedicated acetate sample liners. Soils will be collected continuously from ground surface to at least 5 feet below the deepest impacted interval (as determined by field observations) but not less than 36 feet below ground surface (bgs). Soils will be field screened for the presence of VOCs using a photo-ionization detector (PID).

At minimum, a soil sample will be collected at each boring location from the interval exhibiting the highest PID response. If no PID response above background concentrations is observed, a sample will be collected from the interval immediately above the water table.

In the event that that field observations identify the presence of impacted soil in perimeter borings, a step-out boring shall be installed approximately 10 feet outward (with respect to the approximate plume location) from the boring in which impacted soil was identified. Additional step-out borings shall be installed, as necessary, until field observations indicate that the horizontal extent of subsurface impact has been adequately delineated.

Groundwater samples will be collected from selected borings as described in section 4.1.3.

4.1.3 Groundwater Sampling

Groundwater samples will be collected from selected pre-existing piezometers previously installed at the site. At a minimum, samples will be collected from piezometers: PZ-02, 03, 06, 08, 17, 27, and 28. Low-flow purging and sampling methods will be used to collect samples from each well. Low-flow purging and sampling will be performed following the procedure specified in **Appendix D**. Water and LNAPL measurements will be collected at each monitoring well. Measurements will be recorded in a dedicated bound project field notebook along with the time collected. Measuring equipment will be decontaminated between wells using a laboratory-grade detergent and water solution and reagent grade water rinse.

Groundwater samples will also be collected from geoprobe soil borings to aid in delineation of the extent of groundwater contamination. At each sampling location, a screen point sampler will be driven to the desired depth using a Geoprobe™ unit. Groundwater samples will be collected from the water table interface (approximately 34-ft bgs). At the three borings proposed for vertical delineation a groundwater sample will also be collected from 10-ft below the water table interface (approximately 44-ft bgs).

At the desired depth, a piece of disposable polyethylene tubing with a stainless steel check valve will be inserted through the probe rods into the water bearing zone. The tubing will then be hand oscillated to obtain the sample. Prior to sampling, one to two gallons of water will be purged to reduce sample turbidity. Non-disposable sampling

equipment will be cleaned using distilled water and Alconox detergent with a distilled water rinse prior to the collection of each sample.

4.2 Storm Drains and Sanitary Cesspools

Locations of current of former storm drain drywells and sanitary cesspools within the ADD are provided on **Figure 7**. These structures are currently abandoned in place, removed, or backfilled following demolition of the majority of the structures within the ADD. Several UIC structures are believed to have been removed for construction of the recharge basin to the west of former Bldg. 140. UICs will be located by: identification by surface manholes, or use of metal detectors, or geophysical methods to identify below grade structures, if deemed appropriate. Below grade UICs will be uncovered and lines will be traced to identify overflow structures. Identification of below grade structures will be limited to those areas identified on **Figure 7**.

To determine whether sediments within the subsurface drainage structures have been impacted, samples will be collected from the primary structure(s) identified for each individual system, not already abandoned, following SCDHS protocols. If analytical results exceed SCDHS Action Levels **(Table 7)** then the structure will be remediated to SCDHS Cleanup Levels. If sampling results from a primary structure exceed SCDHS Action Levels then samples will be collected from secondary structures.

Samples will be collected from each location using hand augers and stainless steel sampling equipment. If UICs are identified which have been backfilled samples may be collected using a Geoprobe.

Once all structures requiring characterization are sampled and those requiring remediation are identified the UICs will be cleaned out. Remediation of the structures typically consists of sediment removal using a vacuum (Guzzler) truck until visually clean native soils are encountered; a backhoe or excavator may also be used, as needed. Endpoint samples would be collected and results compared to SCDHS cleanup levels (**Table 7**).

Upon completion of UIC characterization/remediation a "*certificate of sewage disposal system abandonment*" will be filed with the SCDHS office of wastewater management (**Appendix C**).

4.3 Oil-Water Separator/Leaching Pit

Soil borings and temporary groundwater sampling points will be installed in the vicinity of the former oil-water separator/leaching pit location to determine whether the use of the structure has contributed to subsurface impact at the site and to delineate subsurface contamination associated with the structure, if necessary.

A minimum of five soil borings will be installed. One boring will be installed at the approximate center of the former location of the structure; four borings will be installed around the approximate perimeter of the structure. In the event that that field observations identify the presence of impacted soil in perimeter borings, a step-out boring shall be installed approximately 10 feet outward (with respect to the former oil-water separator location)

from the boring in which impacted soil was identified. Additional step-out borings shall be installed, as necessary, until field observations indicate that the horizontal extent of subsurface impact has been adequately delineated.

Soil borings will be installed utilizing a Geoprobe® direct-push drill rig outfitted with a macro-core sampler and dedicated acetate sample liners. Soils will be collected continuously from ground surface to at least 5 feet below the deepest impacted interval (as determined by field observations) but not less than 36 feet below ground surface (bgs). Soils will be field screened for the presence of VOCs using a photo-ionization detector (PID).

At minimum, a soil sample will be collected at each boring location from the interval exhibiting the highest PID response. If no PID response above background concentrations is observed, a sample will be collected from the interval immediately above the water table.

One temporary groundwater sampling point will be installed at the approximate center of the former location of the structure; in the event that field observations identify impacted soil at perimeter boring locations, two additional temporary groundwater sampling points will be installed down-gradient (with respect to groundwater flow) of the former location of the structure.

Groundwater samples will be collected from a depth of approximately three feet below the water table. At each sampling location, a four-foot long screen point sampler will be driven to the desired depth using a Geoprobe® direct-push drill rig. At the desired depth dedicated polyethylene tubing fitted with a stainless steel check valve will be inserted through the probe rods into the water bearing zone. Tubing will then be oscillated by hand to draw water to the surface. Prior to sampling, approximately three to five the volume of standing water within the well point will be purged to reduce sample turbidity.

4.3.1 Oil-water Separator/Leaching Pit Soil Excavation

If investigation results indicate that the oil-water separator/leaching pit has impacted vadose zone soil and the soil is likely a continuing source for groundwater contamination, excavation of the soil will be performed. Excavation will be conducted utilizing standard construction equipment (backhoe, excavator). Excavation will proceed to the extent possible (likely 15 to 20 feet bgs) without utilizing shoring. Endpoint samples will be collected to evaluate the effectiveness of the contaminated soil removal.

If sampling results indicate residual soil contamination remains, application of an oxygen release compound or chemical oxidation compound, such as Regen-Ox, will be evaluated. ORC applications have been shown to promote aerobic biodegradation of petroleum hydrocarbons (ORC). Regen-Ox uses a solid alkaline oxidant that employs a sodium percarbonate complex with a multi-part catalytic formula. The product is delivered as two parts that are combined and are applied to an excavation or injected into the subsurface using common drilling or direct-push equipment. Once in the subsurface, the combined product produces an effective oxidation

reaction comparable to that of Fenton's Reagent without a violent exothermic reaction. Regen-Ox effectively and rapidly destroys a wide range of organic contaminants in both soil and groundwater.

4.4 Soil Vapor Sampling

Soil gas samples will be collected to evaluate the presence of petroleum related VOC vapors in the vadose zone soils.

Five temporary soil vapor points will be installed at the subject site. Soil vapor sampling points will be installed with a Geoprobe™. At each location, a shallow soil vapor sampling point will be installed five feet beneath the surface. In addition, an ambient air sample will be collected from an upwind location. The location of the soil vapor points are shown on **Figure 6**.

The soil gas probes will be installed using a direct-push drill rig (Geoprobe® or equivalent). Soil-vapor samples will be collected in Summa® vacuum canisters fitted with one-hour regulators (certified clean by the laboratory) and analyzed by USEPA Method TO-15 (with middle distillate fuels list, type b). In accordance with New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in New York State, one to three volumes of air (i.e., the volume of the sample probe and tube) will be purged prior to collecting samples and flow rates for both purging and collecting will not exceed 0.2 liters per minute to minimize potential outdoor air infiltration during sampling.

The appropriate Quality Assurance/Quality Control measures detailed in the (NYSDOH) Soil Vapor Intrusion Guidance document will be followed during all phases of sample collection.

4.5 Site Survey

In order to accurately map the horizontal extent of the LNAPL/VOC plume, soil boring, temporary groundwater monitoring point locations, soil gas sampling, and UIC locations will be surveyed by a New York State licensed surveyor relative to a fixed location at the site.

5.0 Quality Assurance Project Plan

This quality assurance project plan (QAPP) presents the objectives, functional activities, methods, and quality assurance / quality control (QA/QC) requirements associated with sample collection and laboratory analysis for characterization activities. The QAPP follows requirements detailed in DER-10, Section 2.

5.1 Project Organization

The investigative efforts defined in this RI work plan will be coordinated by PWGC on behalf of the SCDHS. The following text identifies the responsibilities of various organizations supporting the supplemental investigation:

- The NYSDEC Project Manager (Heather Bishop) will be responsible for reviewing and approving this work plan, coordinating approval of requested modifications, and providing guidance on regulatory requirements.
- The SCDHS Project Manager (James Meyers) will be responsible for reviewing and approving this work plan, providing technical support and acting as a liaison to SCDHS personnel working on the RI and the NYSDEC Project Manager.
- The PWGC Program Manager (James Rhodes) will provide technical expertise for review of the project plans, reports and ongoing field activities. The program manager will be responsible for the coordination of the overall Voluntary Cleanup Program with the SCDHS. The Program manager will act as the projects Quality Assurance Manager.
- PWGC Project Manager (Andrew Lockwood) will be responsible for the day to day project management, task leadership, and project engineering support and for the planning and implementation of investigative activities. The Project Manager is responsible for ensuring that the requirements of this work plan are implemented. The project manager will also act as the site Health and Safety Manager (HSM).
- PWGC Field Team Leader (Thomas Melia) will be responsible for sample collection, oversight of subcontractor personnel, and coordination of daily field activities. Mr. Melia will act as the Site Health and Safety Officer ensuring implementation of the Site Health and Safety Plan.
- Chemtech Environmental Laboratory, a NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified laboratory, will be the analytical laboratory performing required analyses and reporting.
- Subcontractors will perform surveying, drilling, and/or sampling at the direction of the Field Team Leader in accordance with this work plan.

An organizational flow chart showing the lines of responsibility for the project activities is included as **Figure 8**.

5.2 Laboratory Analysis

Requirements for sample analysis are described below.

5.2.1 Soil Samples

Soil samples will be collected as described in Sections 4.1 and 4.2. Proposed soil boring locations are illustrated in **Figure 6**. Soil samples will be submitted to Chemtech Environmental Laboratory, Mountainside, New Jersey a NYSDOH ELAP certified laboratory (or approved equivalent laboratory). Soil samples will be analyzed for VOCs by

USEPA Method 8260 (STARS) and SVOCs by USEPA Method 8270 (STARS). Analysis will conform to NYSDEC Analytical Services Protocol (ASP). Category B data deliverables will be submitted for all samples analyzed. Analytical methods, preservation, container requirements, and holding times are summarized in **Table 9**, below.

TABLE 9
ANALYTICAL METHODS (SOIL)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Laboratory
Soil	SB	Grab	VOCs	8260 (STARS)	Cool to 4°C	14 days	2-oz. wide mouth glass	Chemtech Environmental Laboratory
Soil	SB	Grab	SVOCs	8270 (STARS)	Cool to 4°C	14 days	8-oz. wide mouth glass	Chemtech Environmental Laboratory

5.2.2 Groundwater Samples

Groundwater samples will be collected as described in Section 4.1 and 4.3. Groundwater samples will be submitted to Chemtech Environmental Laboratory, Mountainside, New Jersey a NYSDOH ELAP certified laboratory (or approved equivalent laboratory). Groundwater samples will be analyzed for VOCs by USEPA Method 8260 (STARS) and SVOCs by USEPA Method 8270 (STARS). Analysis will conform to NYSDEC ASP. Category B data deliverables will be submitted for all samples analyzed. Analytical methods, preservation, container requirements, and holding times are summarized in **Table 10**, below.

TABLE 10
ANALYTICAL METHODS (GROUNDWATER)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Laboratory
Ground-water	GW or PZ	Grab	VOCs	8260 (STARS)	Cool to 4°C HCL to pH<2	14 days	40-mL vials	Chemtech Environmental Laboratory
Ground-water	GW or PZ	Grab	SVOCs	8270 (STARS)	Cool to 4°C	7 days	1-L amber glass	Chemtech Environmental Laboratory

5.2.3 UIC Samples

UIC sediment/sludge samples will be collected as described in Section 4.3. Sediment/sludge samples will be submitted to Chemtech Environmental Laboratory, Mountainside, New Jersey a NYSDOH ELAP certified laboratory (or approved equivalent laboratory). Samples will be analyzed for VOCs by USEPA Method 8260 (SCDHS List) and SVOCs by USEPA Method 8270 (SCDHS List), and Metals (SCDHS List). Analysis will conform to NYSDEC ASP protocols. Category B data deliverables will be submitted for all samples analyzed. Analytical methods, preservation, container requirements, and holding times are summarized in **Table 11**, below.

TABLE 11
ANALYTICAL METHODS (Sediment/Sludge)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Laboratory
Sediment /Sludge	UIC	Grab	VOCs	8260 (SCDHS List)	Cool to 4°C HCL to pH<2	14 days	3-40-mL vials	Chemtech Environmental Laboratory
Sediment /Sludge	UIC	Grab	SVOCs	8270 (SCDHS List)	Cool to 4°C	7 days	1-L amber glass	Chemtech Environmental Laboratory
Sediment /Sludge	UIC	Grab	Metals	6010 (SCDHS List)	HNO3 to pH<2	6-months	300 ml-poly	Chemtech Environmental Laboratory

5.2.4 Soil Gas Samples

Soil gas samples will be collected as described in Section 4.4. Samples will be submitted to Chemtech Environmental Laboratory, Mountainside, New Jersey a NYSDOH ELAP certified laboratory (or approved equivalent laboratory). Samples will be analyzed for VOCs by TO-17. Analysis will conform to NYSDEC ASP protocols. Category B data deliverables will be submitted for all samples analyzed. Analytical methods, preservation, container requirements, and holding times are summarized in **Table 12**, below.

TABLE 12
ANALYTICAL METHODS (Soil Gas)

Sample Matrix	Sample Designations	Sample Type	Parameters	EPA Method	Sample Preservation	Holding Time	Sample Container	Laboratory
Soil Gas	SG	Grab	VOCs	TO-15	N/A	14 days	Summa	Chemtech Environmental Laboratory

5.3 Field/Laboratory Data Control Requirements

Quality Control (QC) procedures must be followed in the field and at the laboratory to ensure that reliable data are obtained. When performing this field sampling effort, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity.
QC samples to be collected in the field are provided in **Table 13**.

TABLE 13
FIELD/LABORATORY QC REQUIREMENTS

Sample Type	Frequency	Purpose
Field Duplicate	One duplicate sample, or One per 20 samples of the same matrix.	To evaluate the precision of the field sampling and laboratory analyses.
Equipment Blank	One per type of sampling method used for each batch of sampling equipment. Equipment blanks are collected in the field using analyte-free water supplied by the laboratory.	To assess the cleanliness of the sampling equipment and the effectiveness of the decontamination process.

Trip Blank	One VOA (volatile organic analysis) trip blank per sample cooler that contains site samples to be analyzed for VOAs.	To detect VOC cross-contamination during sample shipping and handling. No trip blanks are anticipated because VOCs are not part of the proposed analytical analysis.
Method Blank	One per 20 samples of same matrix	To document contamination resulting from the analytical process.
Matrix Spike	One per 20 samples of same matrix	It is used to measure the efficiency of all steps of the sampling and analytical methods in recovering the target analytes from the sample. It is a sample spiked with known quantities of analytes and subjected to the entire analytical procedure.
Matrix Spike Duplicate	One per 20 samples of same matrix.	To reinforce the matrix spike information. It is a second aliquot of the same sample as the matrix spike.
Ambient Air	One sample per event	Determine background concentrations of VOCs.

5.4 Sample Identification

Soil sampling rational is provided in Section 4.0. Each soil sample will be identified with a set of information relating individual sample characteristics. Required information may consist of Sample Designation, Depth, Date, Time, and Matrix. Examples of sample IDs are shown below.

- SB-01 @ 14-16' (subsurface soil sample, soil boring #1 from 14 to 16 feet bgs)
- GW-01 @ 32-36' (groundwater sample, sampling point #1, screen depth 32 to 36 feet bgs)
- SG-01 @5' (soil gas sample from location #1 from 5 feet bgs)
- UIC-01 (sludge/sediment sample from UIC structure #1)

Sample frequency, locations, depths, and nomenclature may change subject to field decisions and professional judgment. Estimated sample numbers are provided on **Table 14**, below.

TABLE 14
ESTIMATED NUMBER OF SOIL AND GROUNDWATER SAMPLES

Sample Type	Estimated # of samples to be collected
Subsurface soil samples collected from the former oil-water separator location	10
Groundwater samples collected from the former oil-water separator location	3
LNAPL/VOC Plume delineation soil samples	13
LNAPL/VOC Plume delineation groundwater samples	7
UIC-Storm drain and sanitary cesspool Characterization	15
Soil Gas Samples	5

Note: does not include QA/QC samples

Actual number of samples may vary depending on field conditions and field observations.

5.5 Chain-of-Custody, Sample Packaging and Shipment

Each day that samples are collected, a chain-of-custody/request for analysis form will be completed and submitted to the laboratory with samples to be analyzed. A copy of the chain-of-custody will be retained by the Project Manager. The chain-of-custody will include the project name, sampler's signature, sample IDs, date and time of sample collection, and analysis requested.

Samples will be packaged and shipped in a manner that maintains sample preservation requirements during transport (i.e., ice to keep samples cool until receipt at the laboratory), ensures that sample holding times can be achieved by the laboratory, and prevents samples from being tampered with.

If a commercial carrier ships samples, a bill of lading (waybill) will be used as documentation of sample custody. Receipts for bills of lading and other documentation of shipment shall be maintained as part of the permanent custody documentation. Commercial carriers are not required to sign the chain-of-custody as long as it is enclosed in the shipping container and evidence tape (custody seal) remains in place on the shipping container.

5.6 Data Validation

The main purpose of the data is for use in defining the extent of contamination at the site and to support remedial action decisions. Based upon this data use validation will be performed as described below. Complete data packages will be archived in the project files, and if deemed necessary additional validation can be performed using procedures in the following sections.

5.6.1 Data Validation Requirements

Data validation is performed on analytical data sets, primarily to confirm that sampling and chain-of-custody documentation are complete, sample IDs can be tied to specific sampling locations, samples were analyzed within the required holding times, and analyses met data quality requirements specified in the sampling plan.

5.6.2 Data Validation Methods

Independent third party data validation will be performed on 5% of the sample data, or on one sample from each sample delivery group (SDG) whichever is greater. Data validation will be performed by a qualified subcontractor independent of the project.

5.7 Field Equipment Calibration

Equipment will be inspected and approved by the Field Team Leader before being used. Equipment will be calibrated to factory specifications, if required. Monitoring equipment will be calibrated following manufacturers recommended schedules. Daily field response checks and calibrations will be performed as necessary (i.e. PID calibrations) following manufacturers standard operating procedures. Equipment calibrations will be documented in a designated field logbook.

5.8 Equipment Decontamination

In order to minimize the potential for cross-contamination, non-dedicated drilling and sampling equipment, and heavy equipment shall be properly decontaminated prior to and between sampling/drilling locations.

5.8.1 General Procedures

Heavy equipment will be decontaminated in a designated area. Sampling equipment and probes will be decontaminated in an area covered with plastic sheeting near the sampling location. Waste material generated during decontamination activities will be containerized, stored and disposed of in accordance with the section 5.9

Decontamination of sampling equipment shall be kept to a minimum, and wherever possible, dedicated sampling equipment shall be used. Personnel directly involved in equipment decontamination shall wear appropriate protective equipment.

5.8.2 Heavy Equipment

Drilling equipment shall be decontaminated by steam cleaning prior to performance of the first boring/excavation and between all subsequent borings/excavations. This shall include hand tools, casing, augers, drill rods, excavator bucket and other related tools and equipment. Water used during drilling and/or steam cleaning operations shall be from a potable source.

5.8.3 Sampling Equipment

All sampling equipment (i.e., trowels, knives, split-spoons, bowls, hand augers, etc.)will be decontaminated prior to each use as follows:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination
- Generous tap water rinse
- Distilled water rinse

5.8.4 Meters and Probes

All meters and probes that are used in the field (other than those used solely for air monitoring purposes, e.g., PID meters) will be decontaminated between use as follows:

- Laboratory-grade detergent and tap water solution wash
- Tap water rinse
- Distilled water rinse (triple rinse)

5.9 Waste Management

Project waste management activities are described below.

5.9.1 Management of Investigation Derived Waste

Waste materials generated from the field operations may consist of soil cuttings, purge water, and miscellaneous solid materials such as personal protective equipment (PPE) and supplies. Use of direct push drilling technology will minimize the volumes of investigation-derived waste (IDW) generated. PWGC will arrange for the disposition of all IDW generated during the field operations.

Soil cuttings generated from soil boring installation activities will be stored in 55-gallon drums. Drums will be labeled to indicate the source of the soil and will be stored in a designated area on site. Soil cores and soil cuttings will be field screened using a PID, while performing drilling operations. Drummed soils will be sampled to determine if spreading on-site is appropriate or off-site disposal is required. Following receipt of the analytical results, recommendations for disposition of the drummed soil will be provided to SCDHS and documented in the SI Report.

Development and purge water generated during the field activities will be stored in 55-gallon drums. Drums will be labeled to indicate the source of the fluid and will be stored in a designated area on site. Drummed groundwater will be sampled to determine if discharge to the surface of the site is appropriate or off-site disposal is required. Following receipt of the groundwater sampling results, recommendations for disposition of the water will be provided to SCDHS and documented in the SI Report.

5.9.2 Management of UIC Waste

Sludge and sediment removed from UIC structures will be disposed of at an approved facility permitted to accept the material. Waste characterization samples will be collected and analyzed in accordance with the facilities waste acceptance criteria (WAC). Analytical results and waste manifests will be reported in the supplemental investigation report.

5.9.3 Management of Petroleum Contaminated Soil

If excavation of an identified petroleum contaminated soil source area is performed the excavated soil will be disposed of at an approved facility permitted to accept the material. Waste characterization samples will be collected and analyzed in accordance with the facilities waste acceptance criteria (WAC). Analytical results and waste manifests will be reported in the supplemental investigation report.

Excavated soil will either be placed directly in a conveyance (truck, roll-off, etc.) or temporarily stockpiled on-site. If stockpiled on-site, the stockpiles will be constructed to prevent spread of the material. Typical stockpile construction detail is provided on **Figure 9**.

Analytical results and waste manifests will be reported in the supplemental investigation report.

5.10 Field Documentation

Documentation will take place on either appropriate forms or in a dedicated site logbook. Permanent black or blue ink will be used to record information in the logbook. Errors in field documentation will be lined through, initialed, dated, and corrected. Forms will be kept by the PWGC Field Team Leader during the field activities. Field activities will be documented in the field logbook. The logbook will contain waterproof pages that are consecutively numbered, and be permanently bound with a hard cover. Upon completion of daily activities, unused portions of pages will be lined-through and initialed.

The primary purpose of the field logbook is to document the daily field activities and to provide descriptions of each activity. All entries in the field logbook will be recorded and dated by person making the entry.

6.0 SUPPLEMENTAL INVESTIGATION REPORT PREPARATION

The Supplemental Investigation Report will incorporate the methods and findings of the Supplemental Investigation activities performed as outlined in this work plan. The report will identify specific contamination concentrations throughout each media (e.g. soil, groundwater, etc), delineate the extent of contamination in soil and groundwater, document remedial activities, and provide conclusions and recommendations for additional investigation and/or remedial action. Electronic copies of the Supplemental Investigation Report will be submitted to the NYSDEC along with hard copies. A sample table of contents for the Supplemental Investigation Report is provided below:

1.0 INTRODUCTION
- 1.1 Site Location and Description
- 1.2 Site History
- 1.3 Previous Investigations

2.0 INVESTIGATION
- 2.1 Field Investigation and Technical Approach
- 2.2 Oil-Water Separator Investigation
- 2.3 LNAPL/VOC Plume Delineation
- 2.4 UIC Characterization/Remediation
- 2.5 Soil Gas Sampling
- 2.6 Data Analysis
- 2.7 Analytical Results

3.0 HYDROGEOLOGIC ASSESSMENT AND PHYSICAL SETTING
- 3.1 Site Topography
- 3.2 Surrounding Land Use
- 3.3 Regional Geology/Hydrogeology
- 3.4 Site Geology/Hydrogeology

4.0 NATURE AND EXTENT OF CONTAMINATION
- 4.1 Identification of Source Areas
- 4.2 Groundwater Impacts

5.0 CONCLUSIONS AND RECOMMENDATIONS
- 5.1 Conclusions
- 5.2 Recommendations

6.0 REFERENCES

6.1 Supplemental Investigation Schedule

The preliminary schedule for the major project milestones is presented in **Table 15**. Field work is anticipated to start in August 2008 and be completed by November 2008. A draft Supplemental Investigation Report will be submitted to the NYSDEC by January 2009.

TABLE 15
PROJECT SCHEDULE – FORMER BAUMANN BUS SUPPLEMENTAL INVESTIGATION

WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TASK																			
NYSDEC approved workplan																			
Ten day notice to NYSDEC																			
Oil-Water Separator Investigation																			
LNAPL/VOC Plume Delineation																			
UIC Characterization/Soil Gas Sampling																			
Laboratory Analysis																			
Data Usability and Validation																			
Prepare Supplemental Investigation and Delineation Report																			
Submission of Draft RI Report to NYSDEC																			

7.0 HEALTH AND SAFETY

Field operations will be performed in accordance with the health and safety requirements as provided in the attached Health and Safety Plan (HASP) (**Appendix E**). The HASP outlines the requirements for training, medical surveillance, daily tailgate meetings, emergency response, and accident and injury reporting.

Activity hazard analyses (AHAs) have been completed for identified work activities planned for the investigation.

The PWGC Field Team Leader will be responsible for implementing the HASP, completing the daily tailgate safety meetings and performing necessary Industrial Hygiene (IH) monitoring as specified in the HASP.

8.0 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan (**Appendix F**) provides measures for protection for on-site workers and the downwind community from potential airborne contaminants as a direct result of the Supplemental Investigation at the former Baumann Bus site. The Community Air Monitoring Plan will be implemented and executed in accordance with 29 CFR 1910.120(h), the New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan, and the New York State Department of Environmental Conservation (NYSDEC) TAGM #4031.

TABLES

TABLE 1

Historical Soil Analytical Data Summary - Volatile Organic Compounds
Former Baumann Bus Site

Sample ID:	RSCO[1]	ERM-07		ERM-07		SB-11		SB-12		SB-13		SB-32		SB-33	
Sample Depth:		(31-32')		(32-34')		(27-28')		(36-37')		(34-35')		(30-31')		(27-28')	
Sample Date:		6/27/2002		6/27/2002		7/10/2002		6/21/2002		6/21/2002		6/24/2002		6/24/2002	
Volatile Organic Compounds															
1,1,1-Trichloroethane	0.8	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,1,2,2-Tetrachloroethane	0.6	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,1,2-Trichloroethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,1-Dichloroethane	0.2	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,1-Dichloroethene	0.4	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,2,4-Trichlorobenzene	3.4	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,2-Dibromo-3-chloropropane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,2-Dibromoethane(EDB)	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,2-Dichlorobenzene	7.9	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,2-Dicloroethane	0.1	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,2-Dichloropropane	0.3	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,3-Dichlorobenzene	1.6	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,4-Dichlorobenzene	8.5	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
2-Butanone	0.3	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
2-Hexanone	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
4-Methyl-2-pentanone	1.0	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Acetone	0.2	0.024	J	0.012	J	0.024	J	0.024	J	0.024	J	0.024	J	0.011	U
Benzene	0.060 or MDL	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Bromodichloromethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Bromoform	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Bromomethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Carbon disulfide	2.7	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Carbon tetrachloride	0.6	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Chlorobenzene	1.7	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Chloroethane	1.9	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Chloroform	0.3	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Chloromethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Cyclohexane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Dibromochloromethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Dichlorodifluoromethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Ethylbenzene	5.5	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	6.0	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Isopropylbenzene	2.3	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Methyl acetate	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Methyl tert butyl ether	0.12	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Methylcyclohexane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Methylene chloride	0.1	0.01	U	0.012	J	0.017	U	0.01	U	0.01	U	0.01	U	0.011	U
Styrene	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Tetrachloroethene	1.4	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Toluene	1.5	0.01	U	0.012	J	0.002	J	0.01	U	0.01	U	0.01	U	0.011	U
Trichloroethene	0.7	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Trichlorofluoromethane	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Vinyl chloride	0.2	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Xylene(total)	1.2	0.01	U	0.012	J	0.001	J	0.01	U	0.01	U	0.01	U	0.011	U
cis-1,2-Dichloroethene	0.3	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
cis-1,2-Dichloropropylene	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
trans-1,2-Dichloroethene	0.3	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
trans-1,2-Dichloropropene	NS	0.01	U	0.012	J	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U
Total VOCs	NS	0		0.774		0.013		0		0		0		0	

Notes:

All concentrations are mg/kg (ppm)

Data summarized from O'Brien and Gere Site Investigation Report, January 2004

[1] NYSDEC Recommended Soil Cleanup Objectives (RSCO), Technical and Administrative Guidance Memorandum (TAGM) #4046, 12/00

NS - No standard established

U - Analyte not detected

J - Estimated Value

TABLE 2

Historical Groundwater Analytical Data Summary - Volatile Organic Compounds
Former Baumann Bus Site

Sample ID:	AWQS[1]	ERM-06		ERM-07		ERM-07		PZ-08		PZ-17	
Sample Date:		7/10/2002		7/10/2002		9/25/2002		9/25/2002		9/25/2002	
Volatile Organic Compounds											
1,1,1-Trichloroethane	5	10	U	40	U	1	J	10	U	10	U
1,1,2,2-Tetrachloroethane	5	10	U	40	U	10	U	10	U	10	U
1,1,2-Trichloroethane	1	10	U	40	U	10	U	10	U	10	U
1,1-Dichloroethane	5	10	U	40	U	10	U	10	U	10	U
1,1-Dichloroethene	5	10	U	40	U	10	U	10	U	10	U
1,2,4-Trichlorobenzene	5	10	U	40	U	10	U	10	U	10	U
1,2-Dibromo-3-chloropropane	NS	10	U	40	U	10	U	10	U	10	U
1,2-Dibromoethane(EDB)	NS	10	U	40	U	10	U	10	U	10	U
1,2-Dichlorobenzene	5	10	U	40	U	10	U	10	U	10	U
1,2-Dicloroethane	5	10	U	40	U	10	U	10	U	10	U
1,2-Dichloropropane	1	10	U	40	U	10	U	10	U	10	U
1,3-Dichlorobenzene	5	10	U	40	U	10	U	10	U	10	U
1,4-Dichlorobenzene	5	10	U	40	U	10	U	10	U	10	U
2-Butanone	50#	10	U	40	U	10	U	10	U	10	U
2-Hexanone	50#	10	U	40	U	10	U	10	U	10	U
4-Methyl-2-pentanone	50	10	U	40	U	10	U	10	U	10	U
Acetone	50	10	U	40	U	10	J	22		25	
Benzene	0.7	10	U	40	J	1	J	10	U	10	U
Bromodichloromethane	50#	10	U	40	U	10	U	10	U	10	U
Bromoform	50#	10	U	40	U	10	U	10	U	10	U
Bromomethane	5	10	U	40	U	10	U	10	U	10	U
Carbon disulfide	60	10	U	40	U	10	U	10	U	10	U
Carbon tetrachloride	5	10	U	40	U	10	U	10	U	10	U
Chlorobenzene	5	10	U	40	U	10	U	10	U	10	U
Chloroethane	50	10	U	40	U	10	U	10	U	10	U
Chloroform	7	10	U	40	U	10	U	10	U	10	U
Chloromethane	5	10	U	40	U	10	U	10	U	10	U
Cyclohexane	NS	10	U	72		10		110		96	
Dibromochloromethane	50#	10	U	40	U	10	U	10	U	10	U
Dichlorodifluoromethane	5	10	U	40	U	10	U	10	U	10	U
Ethylbenzene	5	10	U	390		260		590		25	
1,1,2-Trichloro-1,2,2-Trifluoroethane	5	10	U	40	U	10	U	10	U	10	U
Isopropylbenzene	5	10	U	46		28		100		81	
Methyl acetate	NS	10	U	40	U	10	U	10	U	10	U
Methyl tert butyl ether	10	10	U	40	U	10	U	10	U	10	U
Methylcyclohexane	NS	10	U	150		10		170		220	
Methylene chloride	5	10	U	40	U	10	U	10	U	10	U
Styrene	5	10	U	40	U	10	U	10	U	10	U
Tetrachloroethene	5	10	U	40	U	10	U	2	J	10	U
Toluene	5	10	U	260		600		10	U	10	U
Trichloroethene	5	10	U	40	U	10	J	10	U	10	U
Trichlorofluoromethane	5	10	U	40	U	10	U	10	U	10	U
Vinyl chloride	2	10	U	40	U	10	U	10	U	10	U
Xylene(total)	5	10	U	1900		1400		3300		95	
cis-1,2-Dichloroethene	5	10	U	40	U	10	U	10	U	10	U
cis-1,2-Dichloropropylene	0.4	10	U	40	U	10	U	10	U	10	U
trans-1,2-Dichloroethene	5	10	U	40	U	10	U	10	U	10	U
trans-1,2-Dichloropropene	0.4	10	U	40	U	10	U	10	U	10	U
Total VOCs	NS	0		2818		2406		4294		542	

Notes:

[1] NYSDEC Ambient Water Quality Standards (AWQS) and Guidance Values, Technical and Operational Guidance Series (TOGS) 1.1.1, 6/199

Guidance Value

NS - No standard established

U - Analyte not detected

J - Estimated Value

Highlighted compounds exceed AWQS

TABLE 3

Groundwater and LNAPL Measurements in Piezometers

Former Baumann Bus Site

	PZ-02			PZ-03			PZ-05			PZ-06			PZ-08			PZ-09			PZ-17			PZ-27			PZ-28			PZ-30			PZ-44		
Date	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**	**DTW**	**DTP**	**PT**
2/7/2001	34.82	NP	NP	34.69	NP	NP	35.17	34.34	0.83	35.24	34.38	0.86	34.59	34.05	0.54	34.26	33.54	0.72	34.02	NP	NP	35.17	34.41	0.76	35.05	35.04	0.01	31.70	NP	NP	36.22	NP	NP
2/22/2001	34.87	NP	NP	34.74	NP	NP	35.22	34.48	0.74	35.29	34.42	0.87	34.64	34.08	0.56	34.28	33.59	0.69	34.05	NP	NP	35.20	34.45	0.75	35.09	35.08	0.01	31.74	NP	NP	36.27	NP	NP
3/15/2001	34.53	NP	NP	34.40	NP	NP	34.30	34.14	0.16	34.29	34.20	0.09	33.91	33.79	0.12	33.34	NP	NP	33.70	NP	NP	34.21	NP	NP	34.74	NP	NP	31.40	NP	NP	35.93	NP	NP
3/27/2001	34.19	NP	NP	34.05	NP	NP	33.84	NP	0.00	33.87	NP	NP	33.47	NP	NP	33.01	NP	NP	33.37	NP	NP	33.87	NP	NP	34.39	NP	NP	31.05	NP	NP	35.55	NP	NP
4/10/2001	33.22	NP	NP	33.08	NP	NP	32.89	NP	0.00	32.90	NP	NP	32.52	NP	NP	32.04	NP	NP	32.39	NP	NP	32.89	NP	NP	33.41	NP	NP	30.08	NP	NP	34.56	NP	NP
4/24/2001	32.42	NP	NP	32.28	NP	NP	32.06	NP	0.00	32.09	NP	NP	31.69	NP	NP	31.24	NP	NP	31.59	NP	NP	32.10	NP	NP	32.61	NP	NP	29.30	NP	NP	33.78	NP	NP
5/8/2001	32.08	NP	NP	31.95	NP	NP	31.73	NP	0.00	31.76	NP	NP	31.38	NP	NP	30.92	NP	NP	31.27	NP	NP	31.76	NP	NP	32.30	NP	NP	28.97	NP	NP	33.47	NP	NP
5/29/2001	31.84	NP	NP	31.70	NP	NP	31.48	NP	0.00	31.51	NP	NP	31.13	NP	NP	30.68	30.65	0.03	31.02	NP	NP	31.52	NP	NP	32.05	NP	NP	28.72	NP	NP	33.25	NP	NP
6/12/2001	31.90	NP	NP	31.77	NP	NP	31.55	NP	0.00	31.58	NP	NP	31.21	NP	NP	30.74	30.72	0.02	31.10	NP	NP	31.59	NP	NP	32.13	NP	NP	28.80	NP	NP	33.33	NP	NP
7/5/2001	31.73	NP	NP	31.60	NP	NP	31.39	NP	0.00	31.42	NP	NP	31.04	NP	NP	30.60	30.54	0.06	30.93	NP	NP	31.43	NP	NP	31.96	NP	NP	28.63	NP	NP	33.15	NP	NP
7/19/2001	31.78	NP	NP	31.65	NP	NP	31.44	NP	0.00	31.47	NP	NP	31.09	NP	NP	30.66	30.59	0.07	30.97	NP	NP	31.48	NP	NP	32.02	NP	NP	28.68	NP	NP	33.20	NP	NP
8/1/2001	31.88	NP	NP	31.76	NP	NP	31.54	NP	0.00	31.57	NP	NP	31.19	NP	NP	30.81	30.70	0.11	31.09	NP	NP	31.58	NP	NP	32.12	NP	NP	28.80	NP	NP	33.32	NP	NP
8/14/2001	31.88	NP	NP	31.75	NP	NP	31.53	NP	0.00	31.57	NP	NP	31.18	NP	NP	30.75	30.70	0.05	31.07	NP	NP	31.59	NP	NP	32.12	NP	NP	28.78	NP	NP	3.32	NP	NP
8/28/2001	31.83	NP	NP	31.70	NP	NP	31.48	NP	0.00	31.52	NP	NP	31.14	NP	NP	30.69	30.65	0.04	31.03	NP	NP	31.54	NP	NP	32.08	NP	NP	28.79	NP	NP	33.27	NP	NP
9/12/2001	32.12	NP	NP	31.99	NP	NP	31.77	NP	0.00	31.82	NP	NP	31.44	NP	NP	31.01	30.94	0.07	31.32	NP	NP	31.83	NP	NP	32.36	NP	NP	29.03	NP	NP	33.56	NP	NP
9/24/2001	32.23	NP	NP	32.17	NP	NP	31.90	NP	0.00	31.93	NP	NP	31.55	NP	NP	31.08	31.05	0.03	31.44	NP	NP	31.95	NP	NP	32.48	NP	NP	29.13	NP	NP	33.68	NP	NP
10/11/2001	32.46	NP	NP	32.33	NP	NP	32.11	NP	0.00	32.16	NP	NP	31.77	NP	NP	31.42	31.28	0.14	31.66	NP	NP	32.17	NP	NP	32.71	NP	NP	29.36	NP	NP	33.91	NP	NP
10/23/2001	32.67	NP	NP	32.54	NP	NP	32.33	NP	0.00	32.37	NP	NP	31.98	NP	NP	31.51	31.50	0.01	31.87	NP	NP	32.38	NP	NP	32.91	NP	NP	29.58	NP	NP	34.12	NP	NP
11/8/2001	32.94	NP	NP	32.81	NP	NP	32.54	NP	0.00	32.64	NP	NP	32.25	NP	NP	31.77	31.77	0.00	32.14	NP	NP	32.66	NP	NP	33.19	NP	NP	29.85	NP	NP	34.39	NP	NP
11/20/2001	33.13	NP	NP	33.00	NP	NP	32.78	NP	0.00	32.83	NP	NP	32.44	NP	NP	31.97	NP	NP	32.34	NP	NP	32.85	NP	NP	33.38	NP	NP	30.03	NP	NP	34.58	NP	NP
12/5/2001	33.39	NP	NP	33.26	NP	NP	33.05	NP	0.00	33.09	NP	NP	32.70	NP	NP	32.22	NP	NP	32.60	NP	NP	33.11	NP	NP	33.64	NP	NP	30.29	NP	NP	34.84	NP	NP
12/19/2001	33.46	NP	NP	33.58	NP	NP	33.25	NP	0.00	33.29	NP	NP	32.89	NP	NP	32.42	NP	NP	32.79	NP	NP	33.31	NP	NP	33.84	NP	NP	30.50	NP	NP	35.03	NP	NP
1/2/2002	33.79	NP	NP	33.65	NP	NP	33.45	NP	0.00	33.50	NP	NP	33.10	NP	NP	32.63	NP	NP	33.00	NP	NP	33.52	NP	NP	34.04	NP	NP	30.70	NP	NP	35.24	NP	NP
1/18/2002	34.00	NP	NP	35.86	NP	NP	33.66	NP	0.00	33.69	NP	NP	33.31	NP	NP	32.83	NP	NP	33.20	NP	NP	33.72	NP	NP	34.24	NP	NP	30.90	NP	NP	35.45	NP	NP
2/6/2002	34.27	NP	NP	34.15	NP	NP	33.93	NP	0.00	33.99	NP	NP	33.59	NP	NP	33.12	NP	NP	33.48	NP	NP	34.00	NP	NP	34.53	NP	NP	31.20	NP	NP	35.72	NP	NP
2/21/2002	34.48	NP	NP	34.35	NP	NP	34.63	34.07	0.56	34.29	34.17	0.12	33.80	NP	NP	33.34	NP	NP	33.69	NP	NP	34.21	NP	NP	34.74	NP	NP	31.39	NP	NP	35.93	NP	NP
3/6/2002	34.65	NP	NP	34.53	NP	NP	34.90	34.19	0.71	34.68	34.30	0.38	33.96	NP	NP	33.49	NP	NP	33.85	NP	NP	34.37	NP	NP	34.89	NP	NP	31.55	NP	NP	36.08	NP	NP
3/19/2002	34.82	NP	NP	34.69	NP	NP	35.18	34.35	0.83	35.08	34.43	0.65	34.13	NP	NP	33.66	NP	NP	34.02	NP	NP	34.53	NP	NP	35.06	NP	NP	31.72	NP	NP	36.25	NP	NP
4/12/2002	34.98	NP	NP	34.86	NP	NP	35.44	34.48	0.96	35.53	34.53	1.00	34.29	NP	NP	34.48	33.72	0.76	34.18	NP	NP	35.04	34.65	0.39	35.23	35.22	0.01	31.88	NP	NP	36.41	NP	NP
4/23/2002	35.08	NP	NP	34.96	NP	NP	35.55	35.59	0.96	35.67	34.62	1.05	34.39	34.38	0.01	34.65	33.79	0.86	34.28	NP	NP	35.17	34.74	0.43	35.34	35.30	0.04	31.97	NP	NP	36.49	NP	NP
5/7/2002	35.02	NP	NP	34.87	NP	NP	35.29	34.54	0.75	35.40	34.57	0.83	34.29	34.29	0.00	34.41	33.70	0.71	34.19	NP	NP	35.28	34.60	0.68	35.76	35.15	0.61	31.87	NP	NP	36.39	NP	NP
5/23/2002	34.88	NP	NP	34.74	NP	NP	35.02	34.55	0.47	35.18	34.47	0.71	34.18	34.17	0.01	34.21	33.70	0.51	34.06	NP	NP	34.76	34.55	0.21	35.10	NP	NP	31.74	NP	NP	36.26	NP	NP
6/7/2002	34.74	NP	NP	34.61	NP	NP	34.52	34.39	0.13	34.69	34.40	0.29	34.04	34.03	0.01	33.70	33.54	0.16	33.93	NP	NP	34.44	NP	NP	34.97	NP	NP	31.64	NP	NP	36.15	NP	NP
6/19/2002	34.61	NP	NP	34.48	NP	NP	34.26	NP	0.00	34.30	34.29	0.01	33.90	33.90	0.00	33.42	NP	NP	33.78	NP	NP	34.29	NP	NP	34.82	NP	NP	31.49	NP	NP	35.99	NP	NP
7/18/2002	34.52	NP	NP	34.39	NP	NP	34.17	NP	0.00	34.21	NP	NP	33.81	NP	NP	33.35	NP	NP	33.71	NP	NP	34.20	NP	NP	34.73	NP	NP	31.40	NP	NP	35.90	NP	NP
8/2/2002	34.58	NP	NP	33.46	NP	NP	34.25	34.22	0.03	34.27	NP	NP	33.88	NP	NP	33.42	NP	NP	33.79	NP	NP	34.28	NP	NP	34.81	NP	NP	31.48	NP	NP	35.98	NP	NP
8/5/2002	34.53	NP	NP	34.39	NP	NP	34.28	NP	0.00	34.22	NP	NP	33.83	33.82	0.01	33.36	NP	NP	33.71	NP	NP	34.23	NP	NP	34.47	NP	NP	31.42	NP	NP	35.92	NP	NP
8/16/2002	34.74	NP	NP	34.61	NP	NP	34.80	34.31	0.49	34.73	34.38	0.35	34.03	NP	NP	33.75	33.54	0.21	33.93	NP	NP	34.44	NP	NP	34.96	NP	NP	31.63	NP	NP	36.14	NP	NP
8/30/2002	34.79	NP	NP	34.67	NP	NP	34.89	34.35	0.54	34.90	34.41	0.49	34.09	NP	NP	33.95	33.55	0.40	33.98	NP	NP	34.49	NP	NP	35.02	NP	NP	31.68	NP	NP	36.20	NP	NP
1/9/2003	34.32	NP	NP	34.19	NP	NP	33.98	NP	0.00	34.01	NP	NP	33.01	NP	NP	33.50	NP	NP	33.99	NP	NP	33.99	NP	NP	34.53	NP	NP	31.19	NP	NP	35.68	NP	NP
1/24/2003	33.95	NP	NP	33.78	NP	NP	33.58	NP	0.00	33.59	NP	NP	33.17	NP	NP	32.99	NP	NP	33.40	NP	NP	33.40	NP	NP	33.99	NP	NP	30.74	NP	NP	35.27	NP	NP
2/6/2003	33.66	NP	NP	33.51	NP	NP	33.29	NP	0.00	33.33	NP	NP	32.93	NP	NP	Destroyed	NP	NP	32.81	NP	NP	33.31	NP	NP	33.84	NP	NP	30.52	NP	NP	35.01	NP	NP
2/20/2003	33.58	NP	NP	33.45	NP	NP	33.24	NP	0.00	33.27	NP	NP	32.88	NP	NP	Destroyed	NP	NP	32.77	NP	NP	33.27	NP	NP	33.80	NP	NP	naccessable	NP	NP	34.98	NP	NP
3/7/2003	33.08	NP	NP	33.95	NP	NP	32.73	NP	0.00	32.77	NP	NP	32.36	NP	NP	Destroyed	NP	NP	32.60	NP	NP	32.76	NP	NP	33.29	NP	NP	naccessable	NP	NP	34.46	NP	NP
3/21/2003	32.94	NP	NP	32.80	NP	NP	32.59	NP	0.00	32.63	NP	NP	32.22	NP	NP	Destroyed	NP	NP	32.11	NP	NP	32.61	NP	NP	33.15	NP	NP	29.81	NP	NP	34.30	NP	NP
4/2/2003	32.67	NP	NP	32.53	NP	NP	32.31	NP	0.00	32.35	NP	NP	31.95	NP	NP	Destroyed	NP	NP	31.83	NP	NP	32.33	NP	NP	32.88	NP	NP	29.53	NP	NP	34.04	NP	NP
4/18/2003	32.31	NP	NP	32.17	NP	NP	31.96	NP	0.00	31.99	NP	NP	31.59	NP	NP	Destroyed	NP	NP	31.48	NP	NP	31.98	NP	NP	32.51	NP	NP	29.19	NP	NP	33.67	NP	NP
5/2/2003	31.80	NP	NP	31.68	NP	NP	31.45	NP	0.00	31.47	NP	NP	31.08	NP	NP	Destroyed	NP	NP	30.98	NP	NP	31.48	NP	NP	32.00	NP	NP	28.67	NP	NP	33.17	NP	NP
5/16/2003	31.49	NP	NP	31.35	NP	NP	31.14	NP	0.00	31.17	NP	NP	27.76	NP	NP	Destroyed	NP	NP	30.68	NP	NP	31.19	NP	NP	31.71	NP	NP	28.36	NP	NP	32.89	NP	NP
1/18/2008	33.45	NP	NP	33.36	NP	NP	Destroyed	NP	0.00	33.18	NP	NP	32.89	32.73	0.16	Destroyed	NP	NP	32.68	NP	NP	33.18	NP	NP	33.72	NP	NP	39.36	NP	NP	Destroyed	NP	NP

Notes:
All measurements are in feet
PT - LNAPL Thickness
DTW - Depth to Water
DTP - Depth to LNAPL
NP - No LNAPL

TABLE 4

NYSDEC Soil Cleanup Objectives for VOCs

Former Baumann Rug Site

Analyte:	CAS #:	RSCO[1]	Unrestricted Use SCO[2]	Residential Use SCO[2]	Restricted Residential Use SCO[3]	Commercial Use SCO[3]	Industrial Use SCO[3]	Protection of Ecological Resources SCO[3]	Protection of Groundwater SCO[3]
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	NS	NS	NS	NS	NS	NS
1,1,1-Trichloroethane	71-55-6	0.8	0.68	100	100	500	1,000	NS	0.68
1,1,2,2-Tetrachloroethane	79-34-5	0.6	NS	NS	NS	NS	NS	NS	NS
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	6.0	NS	NS	NS	NS	NS	NS	NS
1,1,2-Trichloroethane	79-00-5	NS	NS	NS	NS	NS	NS	NS	NS
1,1-Dichloroethane	75-34-3	0.2	0.27	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	0.4	0.33	100	100	500	1,000	NS	0.33
1,1-Dichloropropene	563-58-6	NS	NS	NS	NS	NS	NS	NS	NS
1,2,3-Trichlorobenzene	87-61-6	NS	NS	NS	NS	NS	NS	NS	NS
1,2,3-Trichloropropane	96-18-4	0.4	NS	NS	NS	NS	NS	NS	NS
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	NS	NS	NS	NS	NS	NS
1,2,4-Trichlorobenzene	120-82-1	3.4	NS	NS	NS	NS	NS	NS	NS
1,2,4-Trimethylbenzene	95-63-6	10	3.6	47	52	190	380	NS	3.6
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	NS	NS	NS	NS	NS	NS
1,2-Dibromoethane	106-93-4	NS	NS	NS	NS	NS	NS	NS	NS
1,2-Dichlorobenzene	95-50-1	7.9	1.1	100	100	500	1,000	NS	1.1
1,2-Dichloroethane	107-06-2	0.1	0.02	2.3	3.1	30	60	10	0.02f
1,2-Dichloropropane	78-87-5	NS	NS	NS	NS	NS	NS	NS	NS
1,3,5-Trimethylbenzene	108-67-8	10	8.4	47	52	190	380	NS	8.4
1,3-Dichlorobenzene	541-73-1	1.6	2.4	17	49	280	560	NS	2.4
1,3-Dichloropropane	142-28-9	0.3	NS	NS	NS	NS	NS	NS	NS
1,4-Dichlorobenzene	106-46-7	8.5	1.8	9.8	13	130	250	20	1.8
2,2-Dichloropropane	590-20-7	NS	NS	NS	NS	NS	NS	NS	NS
2-Butanone	78-93-3	0.3	0.12	100	100	500	1,000	100	0.12
2-Chloroethyl vinyl ether	110-75-8	NS	NS	NS	NS	NS	NS	NS	NS
2-Chlorotoluene	95-49-8	NS	NS	NS	NS	NS	NS	NS	NS
2-Hexanone	591-78-6	NS	NS	NS	NS	NS	NS	NS	NS
2-Propanol	67-63-0	NS	NS	NS	NS	NS	NS	NS	NS
4-Chlorotoluene	106-43-4	NS	NS	NS	NS	NS	NS	NS	NS
4-Isopropyltoluene	99-87-6	10	NS	NS	NS	NS	NS	NS	NS
4-Methyl-2-pentanone	108-10-1	1.0	NS	NS	NS	NS	NS	NS	NS
Acetone	67-64-1	0.2	0.05	100	100	500	1,000	2.2	0.05
Acrolein	107-02-8	NS	NS	NS	NS	NS	NS	NS	NS
Acrylonitrile	107-13-1	NS	NS	NS	NS	NS	NS	NS	NS
Benzene	71-43-2	0.06	0.06	2.9	4.8	44	89	70	0.06
Benzoic Acid	65-85-0	2.7	NS	NS	NS	NS	NS	NS	NS
Bromobenzene	108-86-1	NS	NS	NS	NS	NS	NS	NS	NS
Bromochloromethane	74-97-5	NS	NS	NS	NS	NS	NS	NS	NS
Bromodichloromethane	75-27-4	NS	NS	NS	NS	NS	NS	NS	NS
Bromoform	75-25-2	NS	NS	NS	NS	NS	NS	NS	NS
Bromomethane	74-83-9	NS	NS	NS	NS	NS	NS	NS	NS
Carbon disulfide	75-15-0	2.7	NS	NS	NS	NS	NS	NS	NS
Carbon tetrachloride	56-23-5	0.6	0.76	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	1.7	1.1	100	100	500	1,000	40	1.1
Chlorodifluoromethane	75-45-6	NS	NS	NS	NS	NS	NS	NS	NS
Chloroethane	75-00-3	1.9	NS	NS	NS	NS	NS	NS	NS
Chloroform	67-66-3	0.3	0.37	10	49	350	700	12	0.37
Chloromethane	74-87-3	NS	NS	NS	NS	NS	NS	NS	NS
cis-1,2-Dichloroethene	156-59-2	NS	0.25	50	100	500	1,000	NS	0.25
cis-1,3-Dichloropropene	10061-01-5	NS	NS	NS	NS	NS	NS	NS	NS
Dibromochloromethane	124-48-1	NS	NS	NS	NS	NS	NS	NS	NS
Dibromomethane	74-95-3	NS	NS	NS	NS	NS	NS	NS	NS
Dichlorodifluoromethane	75-71-8	NS	NS	NS	NS	NS	NS	NS	NS
Diisopropyl ether	108-20-3	NS	NS	NS	NS	NS	NS	NS	NS
Ethanol	64-17-5	NS	NS	NS	NS	NS	NS	NS	NS
Ethyl acetate	141-78-6	NS	NS	NS	NS	NS	NS	NS	NS
Ethylbenzene	100-41-4	5.5	1.0	30	41	390	780	NS	1.0
Freon-114	76-14-2	NS	NS	NS	NS	NS	NS	NS	NS
Hexachlorobutadiene	87-68-3	NS	NS	NS	NS	NS	NS	NS	NS
Isopropyl acetate	108-21-4	NS	NS	NS	NS	NS	NS	NS	NS
Isopropylbenzene	98-82-8	NS	NS	NS	NS	NS	NS	NS	NS
Methyl tert-butyl ether	1634-04-4	2.3	0.93	62	100	500	1,000	NS	0.93
Methylene chloride	75-09-2	0.12	0.05	51	100	5000	1,000	12	0.05
n-Amyl acetate	628-63-7	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene	91-20-3	13	NS	NS	NS	NS	NS	NS	NS
n-Butyl acetate	123-86-4	NS	NS	NS	NS	NS	NS	NS	NS
n-Butylbenzene	104-51-8	10	12	100	100	500	1,000	NS	12
n-Propyl acetate	109-60-4	NS	NS	NS	NS	NS	NS	NS	NS
n-Propylbenzene	103-65-1	3.7	3.9	100	100	500	1,000	NS	3.9
p-Diethylbenzene	105-05-5	NS	NS	NS	NS	NS	NS	NS	NS
p-Ethyltoluene	622-96-8	NS	NS	NS	NS	NS	NS	NS	NS
sec-Butylbenzene	135-98-8	10	11	100	100	500	1,000	NS	11
Styrene	100-42-5	NS	NS	NS	NS	NS	NS	NS	NS
t-Butyl alcohol	75-65-0	NS	NS	NS	NS	NS	NS	NS	NS
tert-Butylbenzene	98-06-6	10	5.9	100	100	500	1,000	NS	5.9
Tetrachloroethene	127-18-4	1.4	1.3	5.5	19	150	300	2	1.3
Toluene	108-88-3	1.5	0.7	100	100	500	1,000	36	0.7
trans-1,2-Dichloroethene	156-60-5	0.3	0.19	100	100	500	1,000	NS	0.19
trans-1,3-Dichloropropene	10061-02-6	NS	NS	NS	NS	NS	NS	NS	NS
Trichloroethene	79-01-6	0.7	0.47	10	21	200	400	2	0.47
Trichlorofluoromethane	75-69-4	NS	NS	NS	NS	NS	NS	NS	NS
Vinyl acetate	108-05-4	NS	NS	NS	NS	NS	NS	NS	NS
Vinyl chloride	75-01-4	0.2	0.02	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	1.2	0.26	100	100	500	1,000	0.26	1.6

Notes:
All concentrations are mg/kg (ppm)
[1]NYSDEC Recommended Soil Cleanup Objectives (RSCO), Technical and Administrative Guidance Memorandum (TAGM) #4046, 12/00
[2]NYSDEC 6 NYCRR Environmental Remediation Programs Part 375 Unrestricted Use Soil Cleanup Objectives (SCO) Table 375-6.8a 12/06
[3]NYSDEC 6 NYCRR Environmental Remediation Programs Part Restriced Use of Soil Cleanup Objective (SCO) Table 375-6.8b 12/06
MDL - Method Detection Limt
NS - No Standard Established

TABLE 5

NYSDEC Soil Cleanup Objectives for SVOCs

Analyte:	CAS #:	RSCO[1]	Unrestricted Use SCO[2]	Residential Use SCO[2]	Restricted Residential Use SCO[3]	Commercial Use SCO[3]	Industrial Use SCO[3]	Protection of Ecological Resources SCO[3]	Protection of Groundwater SCO[3]
1,2,4-Trichlorobenzene	120-82-1	NS	NS	NS	NS	NS	NS	NS	NS
1,2-Dichlorobenzene	95-50-1	NS	NS	NS	NS	NS	NS	NS	NS
1,3-Dichlorobenzene	541-73-1	NS	NS	NS	NS	NS	NS	NS	NS
1,4-Dichlorobenzene	106-46-7	NS	NS	NS	NS	NS	NS	NS	NS
2,4,5-Trichlorophenol	95-95-4	0.1	NS	NS	NS	NS	NS	NS	NS
2,4,6-Trichlorophenol	88-06-2	NS	NS	NS	NS	NS	NS	NS	NS
2,4-Dichlorophenol	120-83-2	0.4	NS	NS	NS	NS	NS	NS	NS
2,4-Dimethylphenol	105-67-9	NS	NS	NS	NS	NS	NS	NS	NS
2,4-Dinitrophenol	51-28-5	0.200 or MDL	NS	NS	NS	NS	NS	NS	NS
2,4-Dinitrotoluene	121-14-2	NS	NS	NS	NS	NS	NS	NS	NS
2,6-Dinitrotoluene	606-20-2	1.0	NS	NS	NS	NS	NS	NS	NS
2-Chloronaphthalene	91-58-7	NS	NS	NS	NS	NS	NS	NS	NS
2-Chlorophenol	95-57-8	0.8	NS	NS	NS	NS	NS	NS	NS
2-Methylnaphthalene	91-57-6	36.4	NS	NS	NS	NS	NS	NS	NS
2-Methylphenol	95-48-7	0.100 or MDL	0.33	100	100	500	1,000	NS	0.33
2-Nitroaniline	88-74-4	0.430 or MDL	NS	NS	NS	NS	NS	NS	NS
2-Nitrophenol	88-75-5	0.330 or MDL	NS	NS	NS	NS	NS	NS	NS
3,3´-Dichlorobenzidine	91-94-1	NS	NS	NS	NS	NS	NS	NS	NS
3+4-Methylphenol	108-39-4/106-44	0.9	0.33	100	100	500	1,000	NS	0.33
3-Nitroaniline	99-09-2	0.500 or MDL	NS	NS	NS	NS	NS	NS	NS
4,6-Dinitro-2-methylphenol	534-52-1	NS	NS	NS	NS	NS	NS	NS	NS
4-Bromophenyl phenyl ether	101-55-3	NS	NS	NS	NS	NS	NS	NS	NS
4-Chloro-3-methylphenol	59-50-7	0.240 or MDL	NS	NS	NS	NS	NS	NS	NS
4-Chloroaniline	106-47-8	0.220 or MDL	NS	NS	NS	NS	NS	NS	NS
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	NS	NS	NS	NS	NS	NS
4-Nitroaniline	100-01-6	NS	NS	NS	NS	NS	NS	NS	NS
4-Nitrophenol	100-02-7	0.100 or MDL	NS	NS	NS	NS	NS	NS	NS
Acenaphthene	83-32-9	50.0[a]	20	100	100	500	1,000	20	98
Acenaphthylene	208-96-8	41.0	100	100	100	500	1,000	NS	107
Aniline	62-53-3	0.1	NS	NS	NS	NS	NS	NS	NS
Anthracene	120-12-7	50.0[a]	100	100	100	500	1,000	NS	1,000
Azobenzene	103-33-3	NS	NS	NS	NS	NS	NS	NS	NS
Benzidine	92-87-5	NS	NS	NS	NS	NS	NS	NS	NS
Benzo(a)anthracene	56-55-3	0.224 or MDL	1	1	1	5.6	11	NS	1
Benzo(a)pyrene	50-32-8	0.061 or MDL	1	1	1	1	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1.1	1	1	1	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	50.0[a]	100	100	100	500	1,000	NS	1,000
Benzo(k)fluoranthene	207-08-9	1.1	0.8	1	3.9	56	110	NS	1.7
Benzoic acid	65-85-0	NS	NS	NS	NS	NS	NS	NS	NS
Benzyl alcohol	100-51-6	NS	NS	NS	NS	NS	NS	NS	NS
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	NS	NS	NS	NS	NS	NS
Bis(2-chloroethyl)ether	111-44-4	NS	NS	NS	NS	NS	NS	NS	NS
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	NS	NS	NS	NS	NS	NS
Bis(2-ethylhexyl)phthalate	117-81-7	50.0[a]	NS	NS	NS	NS	NS	NS	NS
Butyl benzyl phthalate	85-68-7	50.0[a]	NS	NS	NS	NS	NS	NS	NS
Carbazole	86-74-8	NS	NS	NS	NS	NS	NS	NS	NS
Chrysene	218-01-9	0.4	1	1	3.9	56	110	NS	1
Dibenzo(a,h)anthracene	53-70-3	0.014 or MDL	0.33	0.33	0.33	0.56	1.1	NS	1,000
Dibenzofuran	132-64-9	6.2	NS	NS	NS	NS	NS	NS	NS
Diethyl phthalate	84-66-2	7.1	NS	NS	NS	NS	NS	NS	NS
Dimethyl phthalate	131-11-3	2.0	NS	NS	NS	NS	NS	NS	NS
Di-n-butyl phthalate	84-74-2	8.1	NS	NS	NS	NS	NS	NS	NS
Di-n-octyl phthalate	117-84-0	50.0[a]	NS	NS	NS	NS	NS	NS	NS
Fluoranthene	206-44-0	50.0[a]	100	100	100	500	1,000	NS	1,000
Fluorene	86-73-7	50.0[a]	30	100	100	500	1,000	30	386
Hexachlorobenzene	118-74-1	0.41	NS	NS	NS	NS	NS	NS	NS
Hexachlorobutadiene	87-68-3	NS	NS	NS	NS	NS	NS	NS	NS
Hexachlorocyclopentadiene	77-47-4	NS	NS	NS	NS	NS	NS	NS	NS
Hexachloroethane	67-72-1	NS	NS	NS	NS	NS	NS	NS	NS
Indeno(1,2,3-c,d)pyrene	193-39-5	3.2	0.5	0.5	0.5	5.6	11	NS	8.2
Isophorone	78-59-1	4.4	NS	NS	NS	NS	NS	NS	NS
Naphthalene	91-20-3	13.0	12	100	100	500	1,000	NS	12
Nitrobenzene	98-95-3	0.200 or MDL	NS	NS	NS	NS	NS	NS	NS
N-Nitrosodimethylamine	62-75-9	NS	NS	NS	NS	NS	NS	NS	NS
N-Nitrosodi-n-propylamine	621-64-7	NS	NS	NS	NS	NS	NS	NS	NS
N-Nitrosodiphenylamine	86-30-6	NS	NS	NS	NS	NS	NS	NS	NS
Pentachlorophenol	87-86-5	1.0 or MDL	0.8	2.4	6.7	6.7	55	0.8	0.8
Phenanthrene	85-01-8	50.0[a]	100	100	100	500	1,000	NS	1,000
Phenol	108-95-2	0.03 or MDL	0.33	100	100	500	1,000	30	0.33
Pyrene	129-00-0	50.0[a]	100	100	100	500	1,000	NS	1,000
Pyridine	110-86-1	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

All concentrations are mg/kg (ppm)

[1]NYSDEC Recommended Soil Cleanup Objectives (RSCO), Technical and Administrative Guidance Memorandum (TAGM) #4046, 12/00

[2]NYSDEC 6 NYCRR Environmental Remediation Programs Part 375 Unrestricted Use Soil Cleanup Objectives (SCO) Table 375-6.8a 12/06

[3]NYSDEC 6 NYCRR Environmental Remediation Programs Part Restriced Use of Soil Cleanup Objective (SCO) Table 375-6.8b 12/06

[a]As per TAGM #4046, Total Semi-VOCs < 500 ppm and Individual Semi-VOCs < 50 ppm

MDL - Method Detection Limt

NS - No Standard Established

TABLE 6

Groundwater Standards for VOCs and SVOCs

Analyte:	CAS #:	Class GA AWQS[1]
Volatile Organic Compounds		
1,1,1,2-Tetrachloroethane	630-20-6	5
1,1,1-Trichloroethane	71-55-6	5
1,1,2,2-Tetrachloroethane	79-34-5	5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5
1,1,2-Trichloroethane	79-00-5	1
1,1-Dichloroethane	75-34-3	5
1,1-Dichloroethene	75-35-4	5
1,1-Dichloropropene	563-58-6	5
1,2,3-Trichlorobenzene	87-61-6	5
1,2,3-Trichloropropane	96-18-4	0.04
1,2,4,5-Tetramethylbenzene	95-93-2	5
1,2,4-Trichlorobenzene	120-82-1	5
1,2,4-Trimethylbenzene	95-63-6	5
1,2-Dibromo-3-chloropropane	96-12-8	0.04
1,2-Dibromoethane	106-93-4	NS
1,2-Dichlorobenzene	95-50-1	3
1,2-Dichloroethane	107-06-2	0.6
1,2-Dichloropropane	78-87-5	1
1,3,5-Trimethylbenzene	108-67-8	5
1,3-Dichlorobenzene	541-73-1	3
1,3-Dichloropropane	142-28-9	5
1,4-Dichlorobenzene	106-46-7	3
2,2-Dichloropropane	590-20-7	5
2-Butanone	78-93-3	50
2-Chloroethyl vinyl ether	110-75-8	NS
2-Chlorotoluene	95-49-8	5
2-Hexanone	591-78-6	50
2-Propanol	67-63-0	NS
4-Chlorotoluene	106-43-4	5
4-Isopropyltoluene	99-87-6	5
4-Methyl-2-pentanone	108-10-1	NS
Acetone	67-64-1	50
Acrolein	107-02-8	5
Acrylonitrile	107-13-1	5
Benzene	71-43-2	0.7
Benzoic Acid	65-85-0	50
Bromobenzene	108-86-1	5
Bromochloromethane	74-97-5	5
Bromodichloromethane	75-27-4	50
Bromoform	75-25-2	50
Bromomethane	74-83-9	5
Carbon disulfide	75-15-0	60
Carbon tetrachloride	56-23-5	5
Chlorobenzene	108-90-7	5
Chlorodifluoromethane	75-45-6	NS
Chloroethane	75-00-3	50
Chloroform	67-66-3	7
Chloromethane	74-87-3	5
cis-1,2-Dichloroethene	156-59-2	5
cis-1,3-Dichloropropene	10061-01-5	0.04
Dibromochloromethane	124-48-1	50
Dibromomethane	74-95-3	5
Dichlorodifluoromethane	75-71-8	5
Diisopropyl ether	108-20-3	NS
Ethanol	64-17-5	NS
Ethyl acetate	141-78-6	NS
Ethylbenzene	100-41-4	5
Freon-114	76-14-2	NS
Hexachlorobutadiene	87-68-3	0.5
Isopropyl acetate	108-21-4	NS
Isopropylbenzene	98-82-8	5
Methyl tert-butyl ether	1634-04-4	10
Methylene chloride	75-09-2	5
n-Amyl acetate	628-63-7	NS
Naphthalene	91-20-3	10
n-Butyl acetate	123-86-4	NS
n-Butylbenzene	104-51-8	5
n-Propyl acetate	109-60-4	NS
n-Propylbenzene	103-65-1	5
p-Diethylbenzene	105-05-5	NS
p-Ethyltoluene	622-96-8	NS
sec-Butylbenzene	135-98-8	5
Styrene	100-42-5	5
t-Butyl alcohol	75-65-0	NS
tert-Butylbenzene	98-06-6	5
Tetrachloroethene	127-18-4	5
Toluene	108-88-3	5
trans-1,2-Dichloroethene	156-60-5	5
trans-1,3-Dichloropropene	10061-02-6	0.04
Trichloroethene	79-01-6	5
Trichlorofluoromethane	75-69-4	5
Vinyl acetate	108-05-4	NS
Vinyl chloride	75-01-4	2
Xylene (mixed)	1330-20-7	5

Analyte:	CAS #:	Class GA AWQS[1]
Semi-Volatile Organic Compounds		
1,2,4-Trichlorobenzene	120-82-1	5
1,2-Dichlorobenzene	95-50-1	3
1,3-Dichlorobenzene	541-73-1	3
1,4-Dichlorobenzene	106-46-7	3
2,4,5-Trichlorophenol	95-95-4	1
2,4,6-Trichlorophenol	88-06-2	NS
2,4-Dichlorophenol	120-83-2	1
2,4-Dimethylphenol	105-67-9	50
2,4-Dinitrophenol	51-28-5	5
2,4-Dinitrotoluene	121-14-2	5
2,6-Dinitrotoluene	606-20-2	5
2-Chloronaphthalene	91-58-7	10
2-Chlorophenol	95-57-8	50
2-Methylnaphthalene	91-57-6	50
2-Methylphenol	95-48-7	5
2-Nitroaniline	88-74-4	5
2-Nitrophenol	88-75-5	5
3,3´-Dichlorobenzidine	91-94-1	5
3+4-Methylphenol	108-39-4/106-44	NS
3-Nitroaniline	99-09-2	5
4,6-Dinitro-2-methylphenol	534-52-1	NS
4-Bromophenyl phenyl ether	101-55-3	NS
4-Chloro-3-methylphenol	59-50-7	5
4-Chloroaniline	106-47-8	5
4-Chlorophenyl phenyl ether	7005-72-3	NS
4-Nitroaniline	100-01-6	5
4-Nitrophenol	100-02-7	5
Acenaphthene	83-32-9	20
Acenaphthylene	208-96-8	20
Aniline	62-53-3	5
Anthracene	120-12-7	50
Azobenzene	103-33-3	5
Benzidine	92-87-5	5
Benzo(a)anthracene	56-55-3	0.002
Benzo(a)pyrene	50-32-8	0.002
Benzo(b)fluoranthene	205-99-2	0.002
Benzo(g,h,i)perylene	191-24-2	5
Benzo(k)fluoranthene	207-08-9	0.002
Benzoic acid	65-85-0	NS
Benzyl alcohol	100-51-6	NS
Bis(2-chloroethoxy)methane	111-91-1	5
Bis(2-chloroethyl)ether	111-44-4	1
Bis(2-chloroisopropyl)ether	108-60-1	NS
Bis(2-ethylhexyl)phthalate	117-81-7	5
Butyl benzyl phthalate	85-68-7	50
Carbazole	86-74-8	NS
Chrysene	218-01-9	0.002
Dibenzo(a,h)anthracene	53-70-3	50
Dibenzofuran	132-64-9	5
Diethyl phthalate	84-66-2	50
Dimethyl phthalate	131-11-3	50
Di-n-butyl phthalate	84-74-2	50
Di-n-octyl phthalate	117-84-0	50
Fluoranthene	206-44-0	50
Fluorene	86-73-7	50
Hexachlorobenzene	118-74-1	0.35
Hexachlorobutadiene	87-68-3	5
Hexachlorocyclopentadiene	77-47-4	5
Hexachloroethane	67-72-1	5
Indeno(1,2,3-c,d)pyrene	193-39-5	0.002
Isophorone	78-59-1	50
Naphthalene	91-20-3	10
Nitrobenzene	98-95-3	5
N-Nitrosodimethylamine	62-75-9	50
N-Nitrosodi-n-propylamine	621-64-7	50
N-Nitrosodiphenylamine	86-30-6	50
Pentachlorophenol	87-86-5	1
Phenanthrene	85-01-8	50
Phenol	108-95-2	1
Pyrene	129-00-0	50
Pyridine	110-86-1	50

Notes:
All concentrations are µg/L (ppb)

[1]NYSDEC Class GA Ambient Water Quality Standards (AWQS), Technical and Operational Guidance Series 1.1.1, Ambient Water Quality Standards and Guidace Values and Groundwater Effluent Limitations, 6/98

NS - No Standard Established

TABLE 7

SCDHS Action Levels and Cleanup Objectives
Former Baumann Bus Site

Compound	SCDHS Action Levels[1]	SCDHS Cleanup Objectives[1]
Volatile Organic Compounds		
1,1,1,2-Tetrachloroethane	600	300
1,1,1-Trichloroethane	1,600	800
1,1,2,2-Tetrachloroethane	1,200	600
1,1,2-Trichloroethane	600	300
1,1-Dichloroethane	400	200
1,1-Dichloroethene	800	400
1,1-Dichloropropene	600	300
1,2,3-Trichlorobenzene	6,800	3,400
1,2,3-Trichloropropane	800	400
1,2,4,5-Tetramethylbenzene	15,000	10,000
1,2,4-Trichlorobenzene	6,800	3,400
1,2,4-Trimethylbenzene	4,800	2,400
1,2-Dibromo-3-chloropropane	1,000	500
1,2-Dibromoethane	600	300
1,2-Dichlorobenzene	15,000	8,000
1,2-Dichloroethane	200	100
1,2-Dichloropropane	600	300
1,3,5-Trimethylbenzene	5,200	2,600
1,3-Dichlorobenzene	3,200	1,600
1,3-dichloropropane	600	300
1,4-Dichlorobenzene	15,000	8,000
2,2-Dichloropropane	600	300
2-Butanone	600	300
2-Chlorotoluene	3,600	1,800
4-Chlorotoluene	3,600	1,800
4-Isopropyltoluene	7,800	3,900
4-Methyl-2-pentanone	2,000	1,000
Acetone	**	**
Benzene	120	60
Bromobenzene	1,600	800
Bromochloromethane	400	200
Bromodichloromethane	600	300
Bromoform	1,000	500
Carbon tetrachloride	1,200	600
Chlorobenzene	3,400	1,700
Chloroethane	400	200
Chloroform	600	300
Chlorotoluene(s)	3,600	1,800
cis-1,2-Dichloroethene	600	300
cis-1,3-Dichloropropene	600	300
Dibromochloromethane	600	300
Dibromomethane	400	200
Dichlorodifluoromethane	600	300
Ethylbenzene	11,000	5,500
Freon-114	12,000	6,000
Hexachlorobutadiene	15,000	10,000
Isopropylbenzene	5,200	2,600
m,p-Xylene	2,400 *	1,200
Methyl tert-butyl ether	1,200	600
Methylene chloride	200	100
Methylethylketone	600	300
Methylisobutylketone	2,000	1,000
Naphthalene	15,000	10,000
n-Butylbenzene	6,800	3,400
n-Propylbenzene	5,000	2,500
o-Xylene	2,400 *	1,200
p-Diethylbenzene	7,600	3,800
p-Ethyltoluene	3,600	1,800
p-Isopropyltoluene	7,800	3,900
sec-Butylbenzene	10,000	5,000
Styrene	2,000	1,000
tert-Butylbenzene	6,800	3,400
Tetrachloroethene	2,800	1,400
Toluene	3,000	1,500
trans-1,2-Dichloroethene	600	300
trans-1,3-Dichloropropene	600	300
Trichloroethene	1,400	700
Trichlorofluoromethane	1,600	800
Vinyl chloride	400	200
Semi-Volatile Organic Compounds		
Acenaphthene	75,000	50,000
Anthracene	75,000	50,000
Benzo(a)anthracene	6,000	3,000
Benzo(a)pyrene	22,000	11,000
Benzo(b)fluoranthene	2,200	1,100
Benzo(g,h,i)perylene	75,000	50,000
Benzo(k)fluoranthene	2,200	1,100
Chrysene	800	400
Dibenzo(a,h)anthracene	75,000	50,000
Fluoranthene	75,000	50,000
Fluorene	75,000	50,000
Indeno(1,2,3-cd)pyrene	6,400	3,200
Phenanthrene	75,000	50,000
Pyrene	75,000	50,000
Metals		
Arsenic	25	7.5
Beryllium	8	1.6
Cadmium	10	1
Chromium	100	10
Copper	500	25
Lead	400	100.0
Mercury	2	0.1
Nickel	1,000	13
Silver	100	5

Notes:
All concentrations are ug/kg (ppb) except Metals which are mg/kg
[1] Action Levels & Cleanup Objectives, SCDHS Article 12 - SOP 9-95, January 7, 1999.
* Refers to the sum of all isomers
** Standard is determined on a case by case basis
Highlighted text denotes concentrations exceeding SCDHS Guidance Levels.
MDL - Method detection limit
U - Indicates that the analyte was not detected above the laboratory MDL
J - Indicates an estimated value
B - Indicates the analyte was detected in the method blank
NS - Not Specified

TABLE 8

USEPA Target Soil-Gas Concentrations
Former Baumann Bus Site

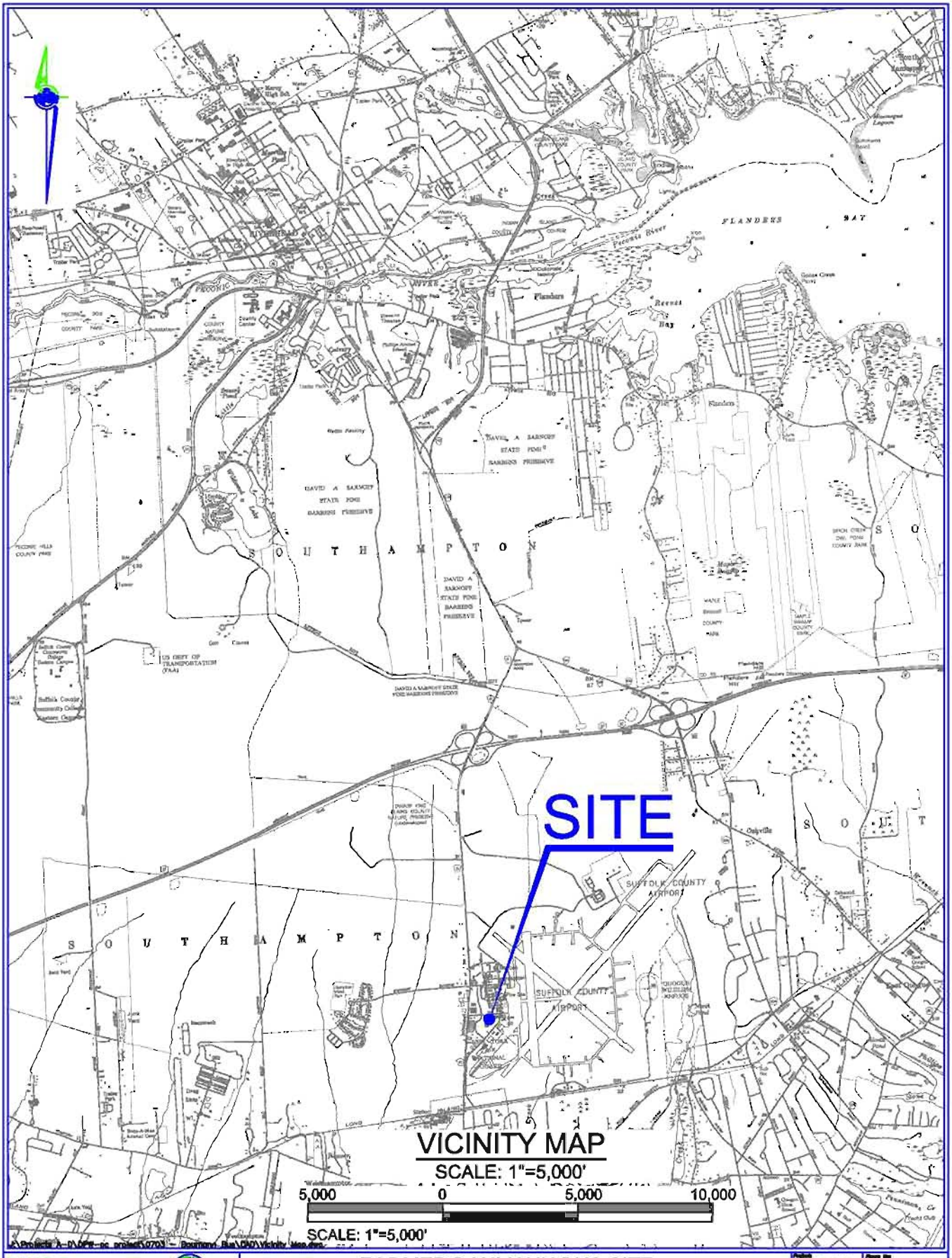
Compound	Target Soil Gas Concentrations (1)
1,1 Dichloroethane	9.4
1,1 Dichloroethene	NS
1,2 Dibromoethane	1.1
1,2 Dichlorobenzene (v)	2,000
1,2 Dichloroethane	9.4
1,2 Dichloropropane	40
1,2-Dichlorotetrafluoroethane	NS
1,3 Butadiene	0.87
1,3 Dichlorobenzene (v)	1,100
1,4 Dichlorobenzene (v)	8,000
1,4-Dioxane	NS
111 Trichloroethane	22,000
112 Trichloroethane	15
1122Tetrachloroethane	4.2
124-Trimethylbenzene	60
135-Trimethylbenzene	60
2,2,4-Trimethylpentane	NS
2-Hexanone	NS
3-Chloropropene	NS
Acetone	3,500
Acrylonitrile	3.6
Benzene	31
Benzyl Chloride	50
Bromodichloromethane	14.0
Bromoform	220
Bromomethane	50
c-1,2-Dichloroethene	350
c-1,3Dichloropropene	NG
Carbon disulfide	7,000
Carbon Tetrachloride	16
Chlorobenzene	600
Chlorodibromomethane	10
Chloroethane	100,000
Chloroform	11
Chloromethane	240
Cyclohexane	NS
Dichlordifluoromethane	2,000
Ethyl Acetate	320,000
Ethyl alcohol	NS
Ethyl Benzene	220
Freon 113	300,000
Heptane	NS
Hexachlorobutadiene	11
Hexane	2,000
Isopropyl Alcohol	NS
m + p Xylene	70,000
Methyl Ethyl Ketone	10,000
Methylene Chloride	520
Methylisobutylketone	800
o Xylene	70,000
p-Ethyltoluene	NS
Propylene	NS
Styrene	10,000
t-1,2-Dichloroethene	700
t-1,3Dichloropropene	NS
ter.ButylMethylEther	30,000
tert. Butyl Alcohol	NS
Tetrachloroethene	81
Tetrahydrofuran	NS
Toluene	4,000
Trichloroethene	2.2
Trichlorofluoromethane	7,000
Vinyl Acetate	2,000
Vinyl Bromide	NS
Vinyl Chloride	28

Notes:

(1) Target Shallow Soil Gas Concentrations, USEPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil (Subsurface Vapor Intrusion Guidance) Table 2b Risk = 1×10^{-5}

NS - Not Specified.
All units are $\mu g/m^3$.

FIGURES



VICINITY MAP

SCALE: 1"=5,000'

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630 Johnson Ave. Suite 7 Bohemia, N.Y. 11716-2615
Ph 631 589-6353 Fx 631 589-8705 E-mail: info@pwgroup.com

FORMER BAUMANN BUS SITE
GABRESKI AIRPORT
WEST HAMPTON, NY

Project	DPW0703
Approved By	TM
Approved By	PWG
Drawn By	TC\LLG
Figure No.	1
Date	1/25/08



BASE MAP PROVIDED BY:
O'BRIEN & GERE
ENGINEERS INC.
DATED: MAY, 2003

IMAGE PROVIDED BY:
Google

A.D.D. BOUNDARIES

SCALE: 1"=200'

LEGEND

AIRPORT DEVELOPMENT DISTRICT BOUNDRIES

0 200 400

SCALE: 1" = 200'

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DESIGNED BY:	TM	DATE:	2/8/08
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SHEET TITLE

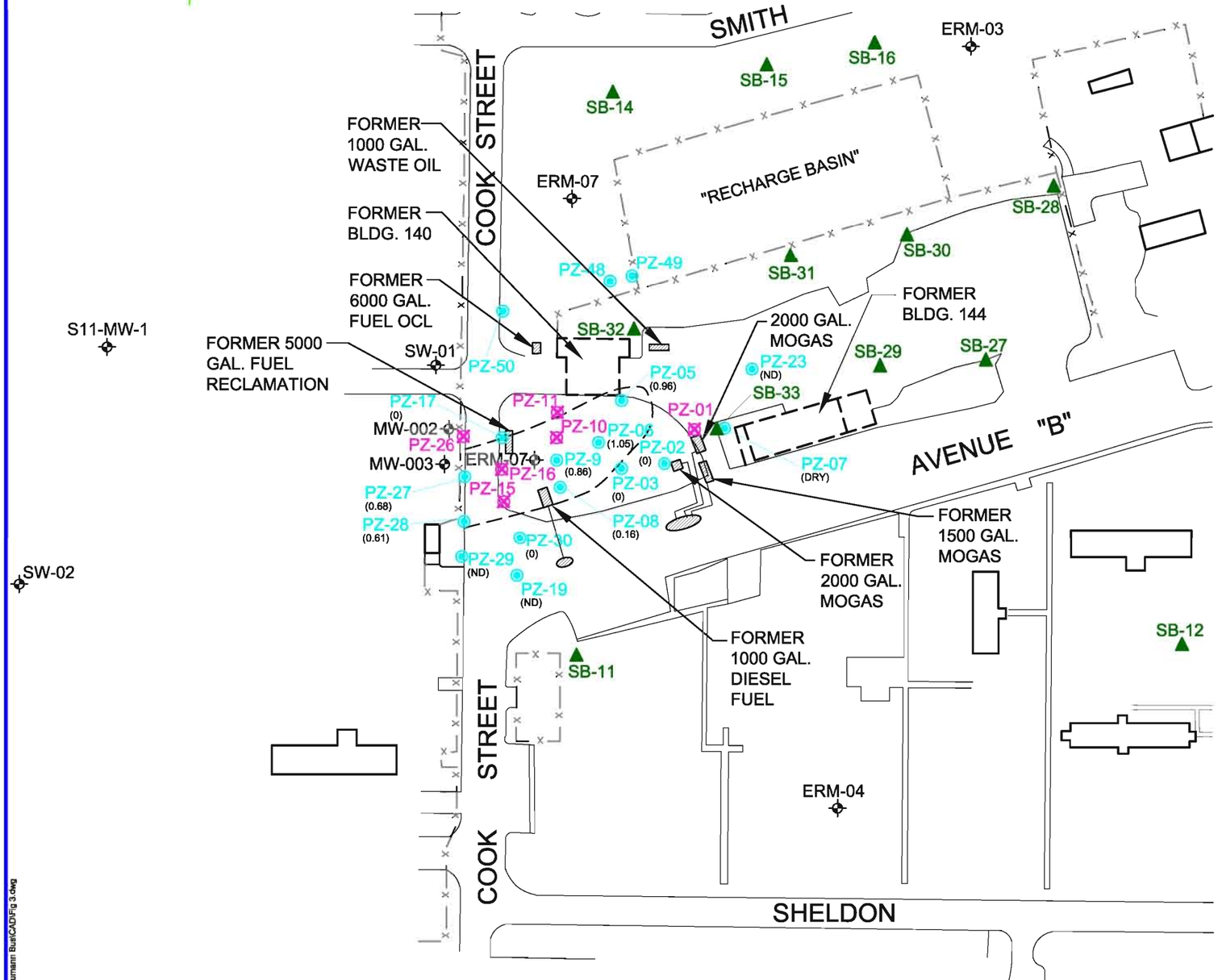
A.D.D. BOUNDARIES

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WEST HAMPTON, NY

FIGURE NO 2

SHEET - OF -

J:\Projects A-D\pw PC PROJECT\0703 - Baumann Bld\DWG\Fig 2 Extns Site.dwg



HISTORIC SAMPLE LOCATIONS

SCALE: 1"=100'

BASE MAP PROVIDED BY:
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LEGEND

TP-01	TEXT PIT LOCATION
SB-02	SOIL BORING LOCATION
ERM-03	MONITORING WELL LOCATION
PZ-26	PIEZOMETER LOCATION
PZ-01	PIEZOMETER DESTROYED AS OF 2002
(ND)	NO DATA
(0.16')	MAXIMUM RECORDED THICKNESS DURING 2002
- - - -	INFERRED HYDROCARBON PLUME
	APPROXIMATE LOCATION OF FORMER PETROLEUM STORAGE TANKS

0 100 200

SCALE: 1" = 100'

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DESIGNED BY:	AL	DATE:	1/9/08
DRAWN BY:	LLG	SCALE:	AS SHOWN

SHEET TITLE

SITE PLAN W/ HISTORIC SAMPLE LOCATIONS

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WEST HAMPTON, NY

FIGURE NO 3

SHEET - OF -

J:\Projects A-D\Dpw-PC PROJECT\0703 - Baumann Bus\CAD\Fig 3.dwg



0.5 MILE RADIUS MAP

SCALE: 1" = 1000'

0 1,000 2,000

SCALE: 1" = 1,000'

BAUMANN BUS
0.5 MILE RADIUS MAP
GABRESKI AIRPORT
WEST HAMPTON, NY

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Project: OPW070J	Designed By: TM	Figure No: 4
CAD Operator: LLG	Approved By: PWG	Date: 2/6/08



AREA PLAN

SCALE: 1"=3,000'

BASE MAP BY:
PEER CONSULTANTS, P.C.
78 MITCHELL ROAD
OAK RIDGE, TENNESSEE
DATED: DECEMBER 2004

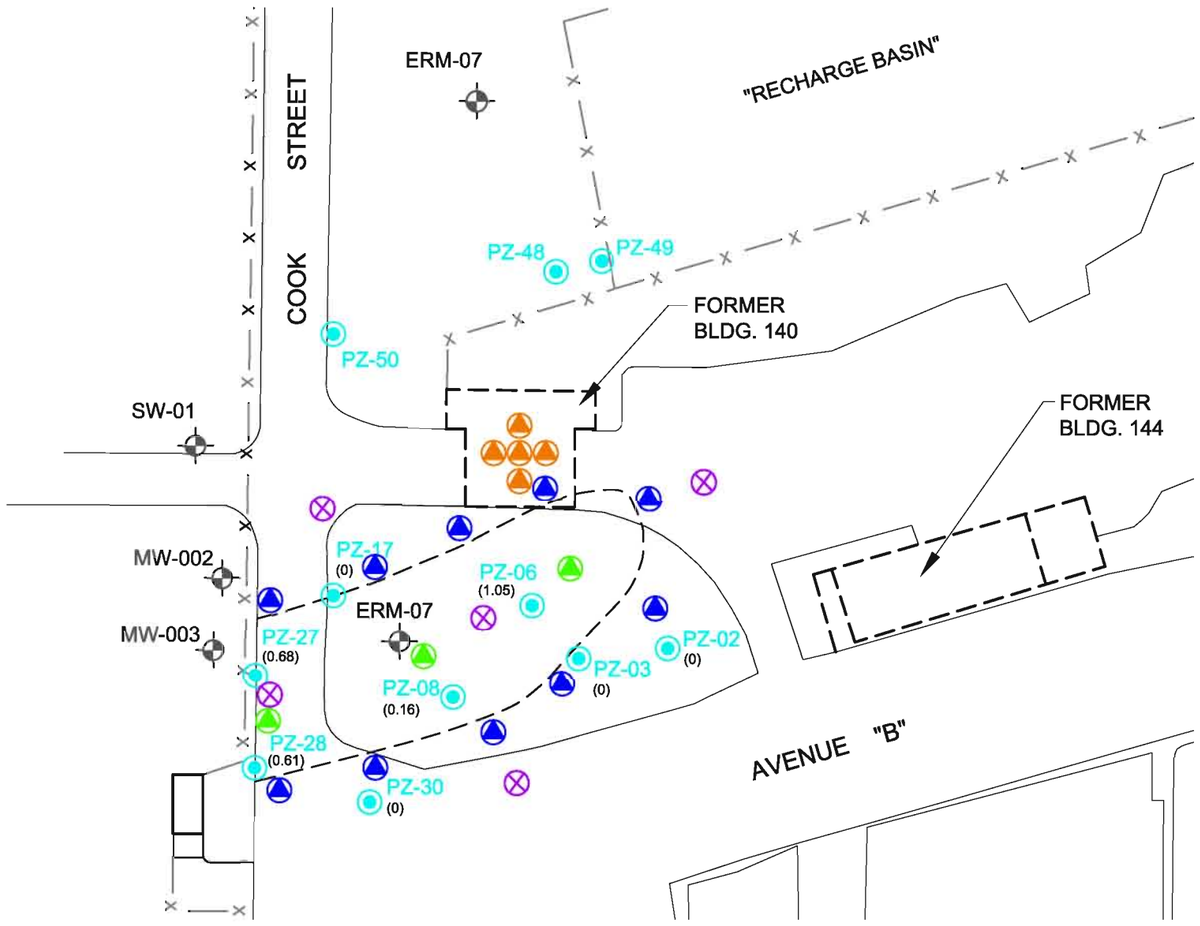
0 3,000 6,000

SCALE: 1" = 3,000'

BAUMANN BUS
PUBLIC DRINKING WATER SUPPLY
WELL LOCATIONS
GABRESKI AIRPORT
WEST HAMPTON, NY

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Project: DPW070.3	Designed By: AL	Figure No: 5
CAD Operator: LLG	Approved By: PWG	Date: 5/2/08



PROPOSED SAMPLE LOCATIONS

(OIL WATER SEPARATOR / PLUME DELINEATION)

SCALE: 1"=60'

BASE MAP PROVIDED BY:
O'BRIEN & GERE
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LEGEND

- PROPOSED BORING LOCATION (OIL WATER SEPARATOR)
- PROPOSED BORING LOCATION (VERTICAL DELINEATION)
- PROPOSED BORING LOCATION (HORIZONTAL DELINEATION)
- ERM-03 — MONITORING WELL LOCATION
- PZ-26 — PIEZOMETER LOCATION
- (ND) — NO DATA
- (0.16') — MAXIMUM RECORDED THICKNESS DURING 2002
- PROPOSED SOIL GAS SAMPLING LOCATIONS

0 100 200

SCALE: 1" = 100'

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DRAWN BY:	LLG	SCALE:	AS SHOWN

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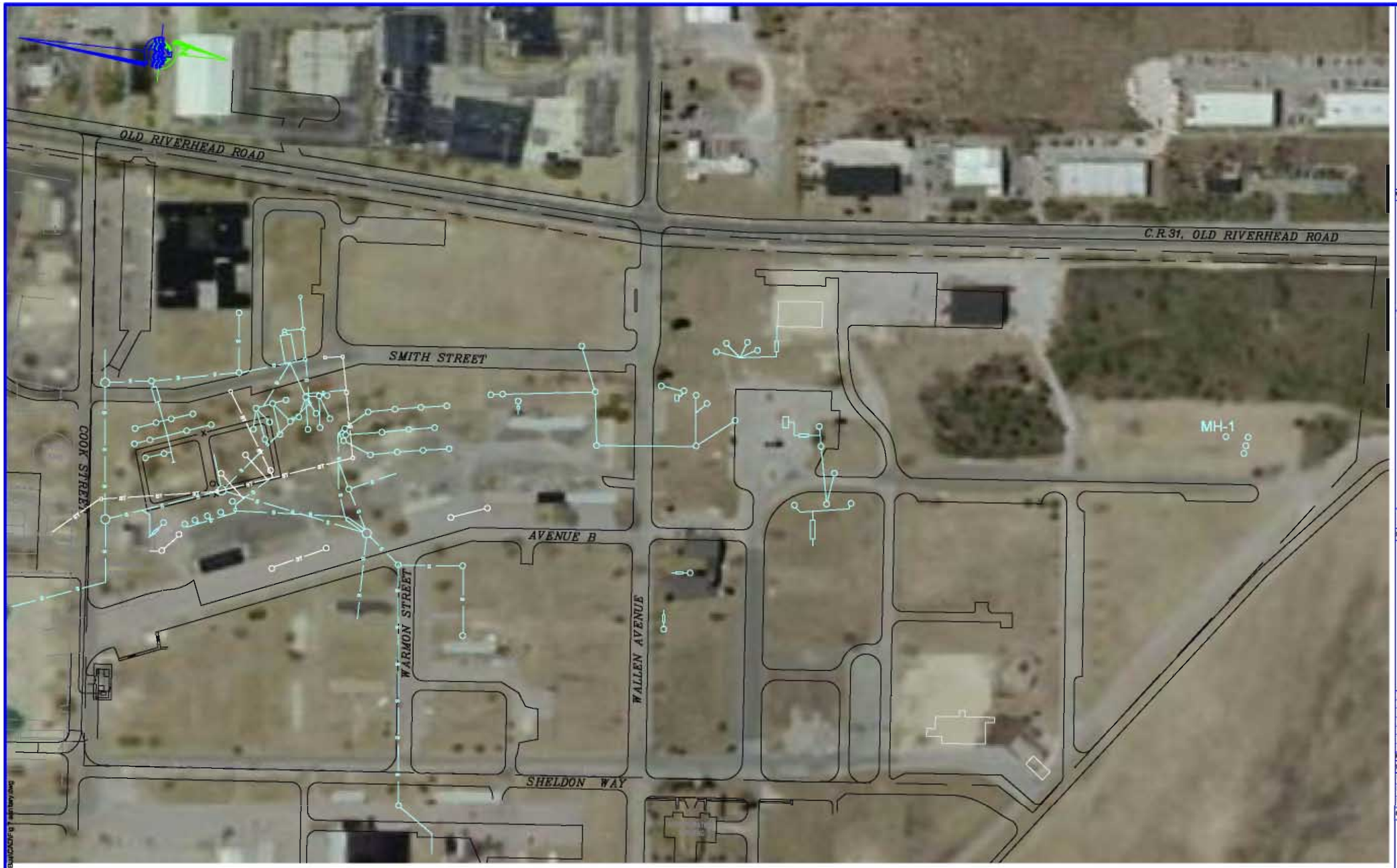
PROPOSED SAMPLE LOCATIONS (OIL WATER SEPARATOR/ PLUME DELINEATION)

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WEST HAMPTON, NY

FIGURE NO
6

SHEET - OF -

J:\Projects A-D\Dpw-PC PROJECT\0703 - Baumann Bus\CAD\Fig 6.dwg



BASE MAP PROVIDED BY:
O'BRIEN & GERE
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DATED: MAY, 2003

IMAGE PROVIDED BY:
Google

POSSIBLE SAMPLING LOCATIONS
(STORM DRAINS & SANITARY CESSPOOLS)

SCALE: 1"=200'

LEGEND

SANITARY SYSTEM
STORM DRAIN SYSTEM

0 200 400
SCALE: 1" = 200'

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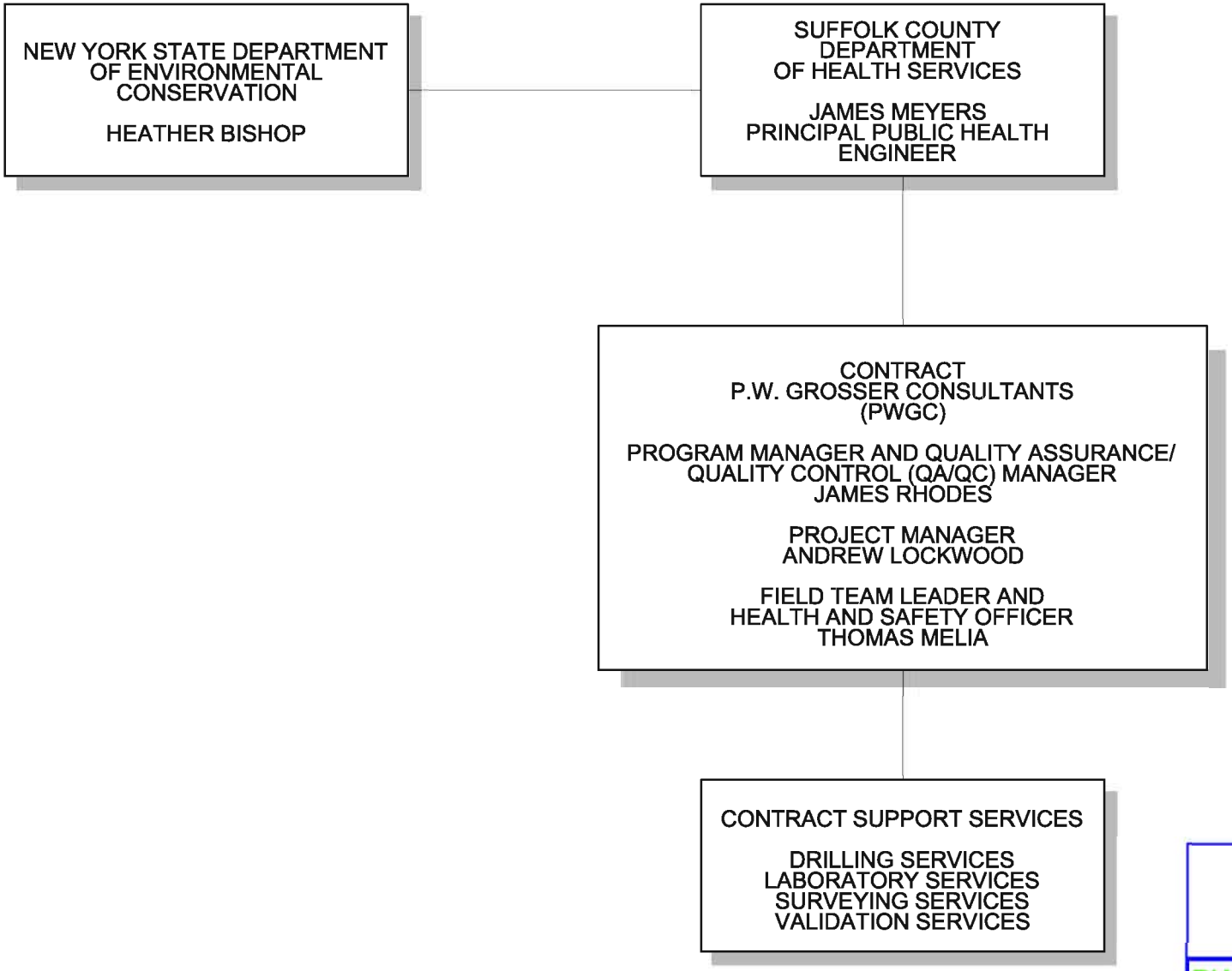
SANITARY SYSTEM

AIRPORT DEVELOPMENT DISTRICT
FRANCIS S. GABRESKI AIRPORT
WEST HAMPTON, NY

FIGURE NO 7

SHEET - OF -

J:\Projects A-D\pw PC PROJECT\0703 - Baumann Build\DGN\Fig 7 sanitary.dwg



BAUMANN BUS
PROJECT MANAGEMENT
ORGANIZATION CHART
GABRESKI AIRPORT
WEST HAMPTON, NY

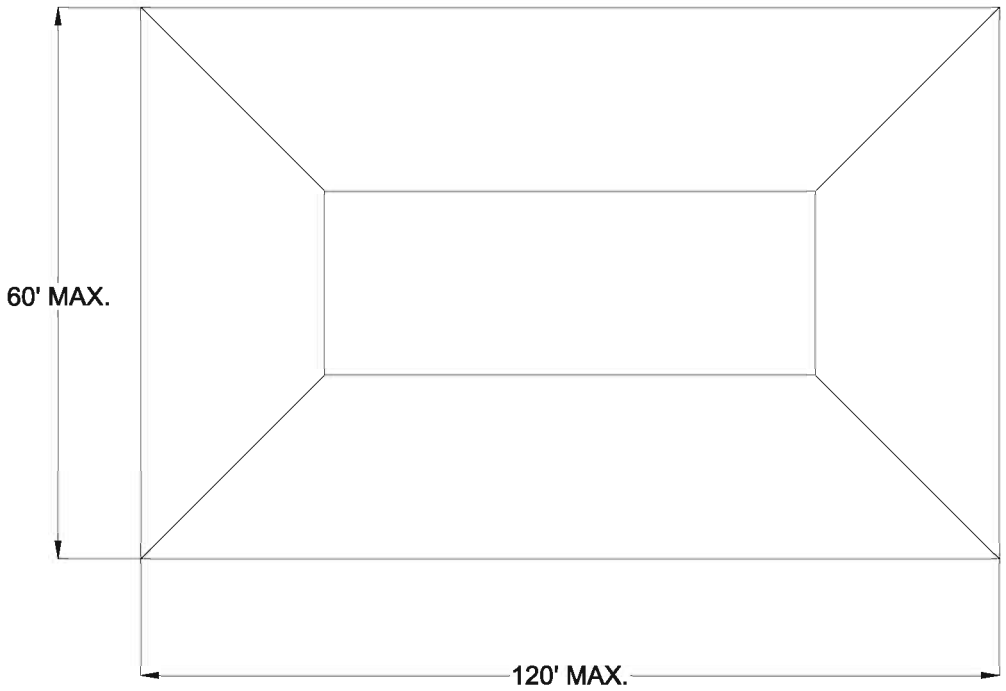
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Project: DPW070.3	Designed by: AL	Figure No: 9
CADD Operator: LLG	Approved by: PWG	Date: 2/6/08



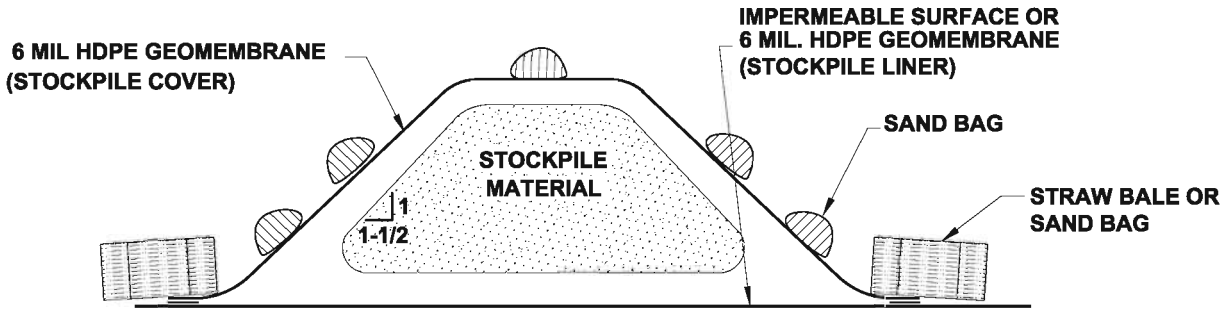
STOCKPILE DETAIL- SIDE VIEW

N.T.S.



STOCKPILE DETAIL- TOP VIEW

N.T.S.



LINER DETAIL

N.T.S.

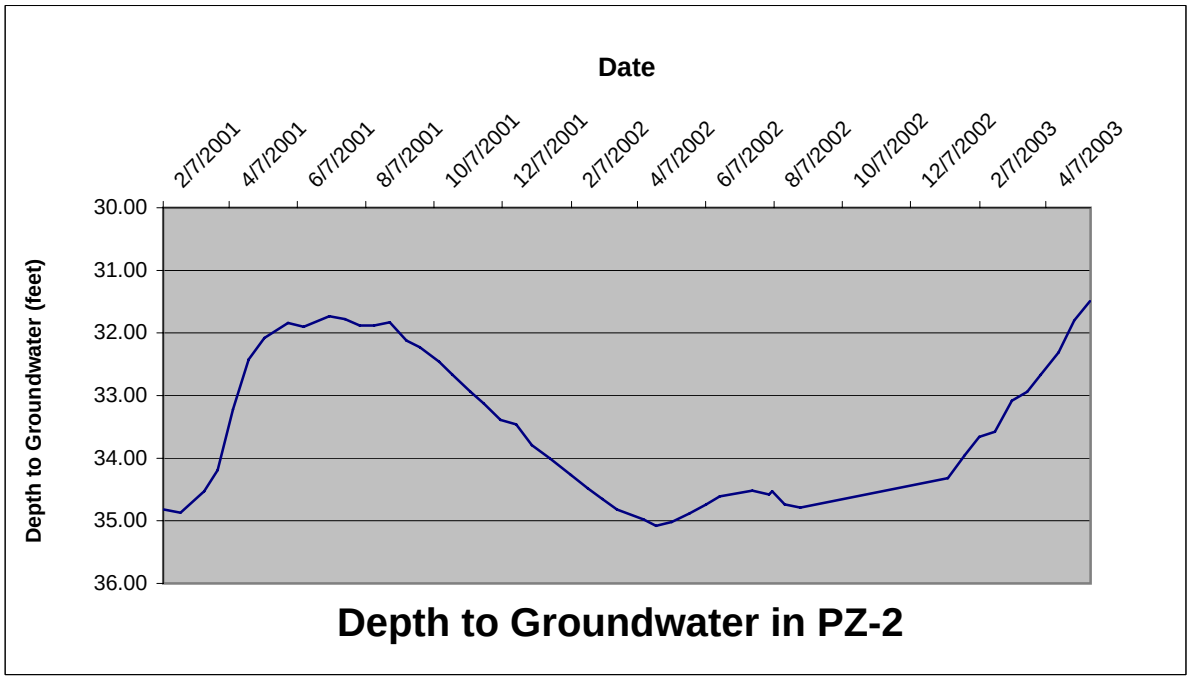
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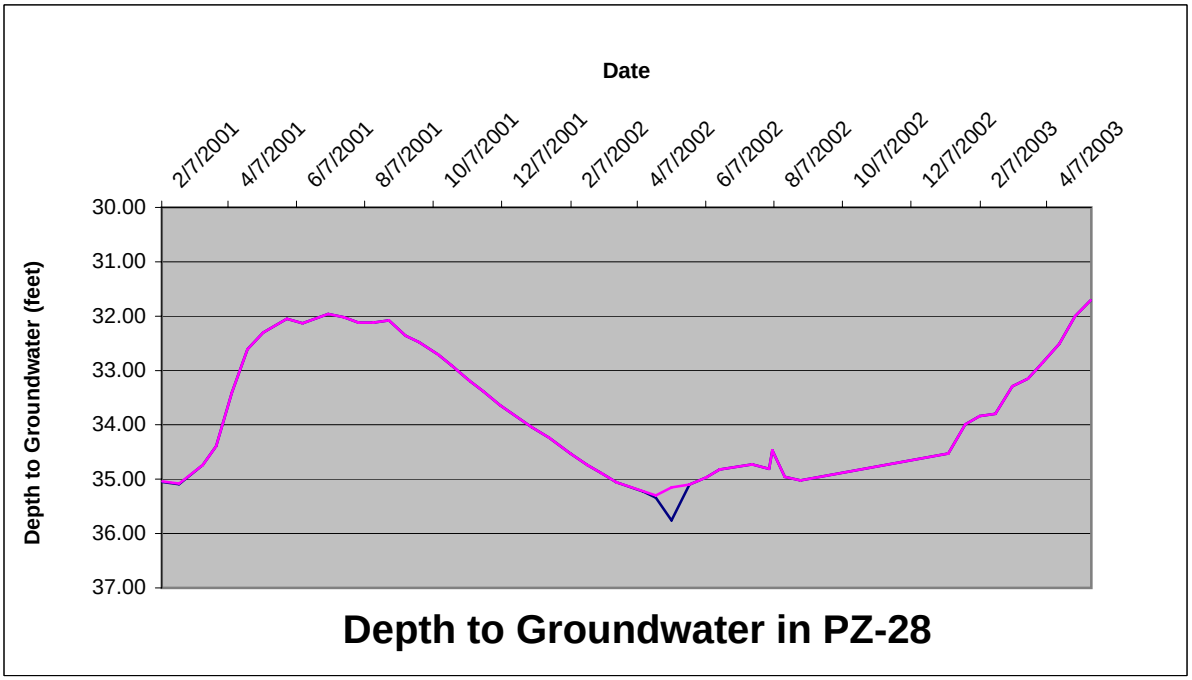
TYPICAL SOIL STOCKPILE DETAIL
BAUMANN BUS SITE
WESTHAMPTON, NEW YORK

Project: DPW0703
Designed by: AL
Approved by: PWG
Drawn by: TC/TEB
Figure No: 9
Date: 5/2/08

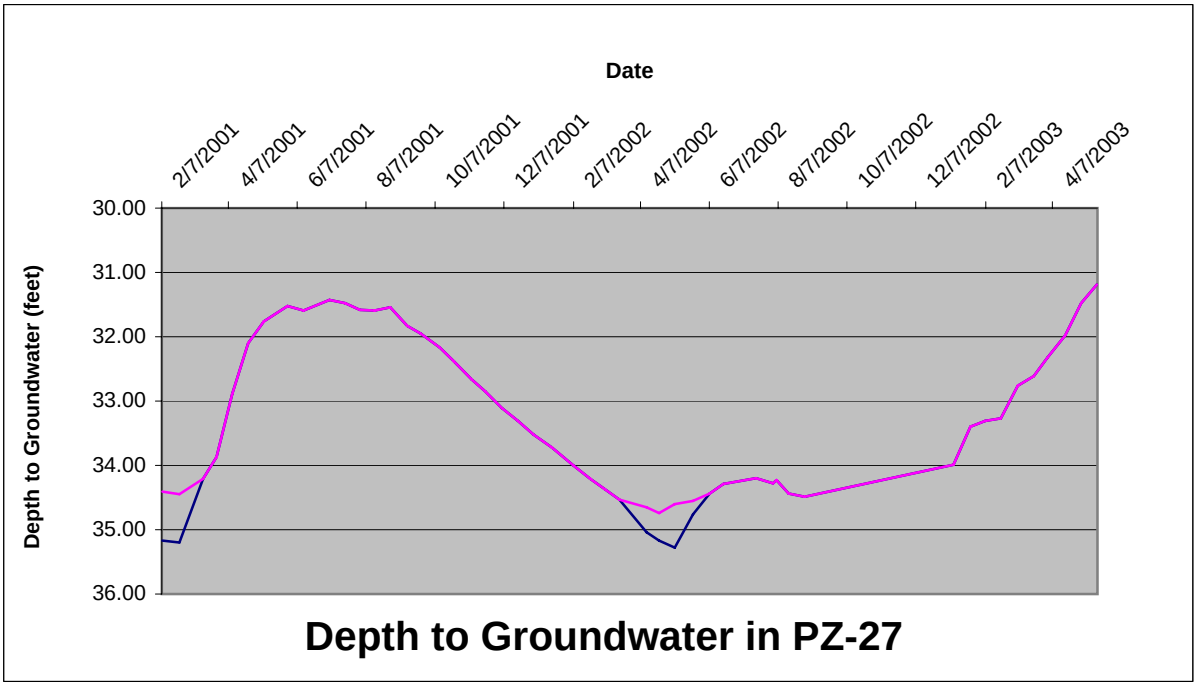
APPENDIX A
GROUNDWATER ELEVATIONS
AND
LNAPL THICKNESS



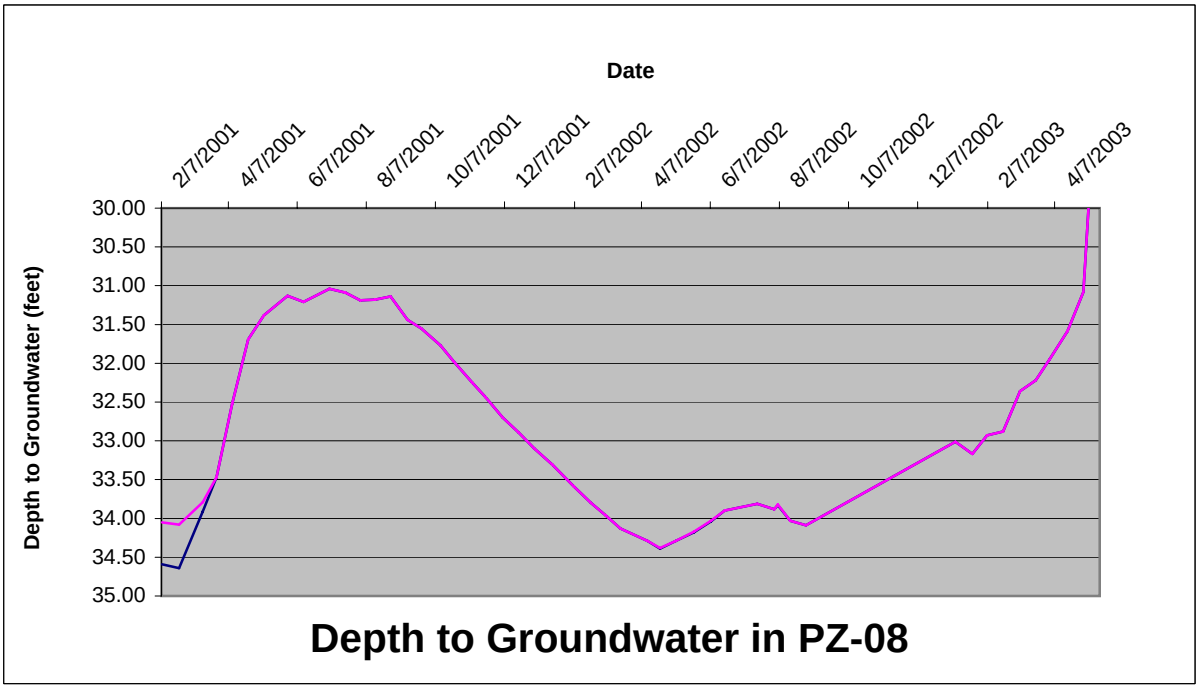
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Depth to water measurement
Where lines intersect no LNAPL present



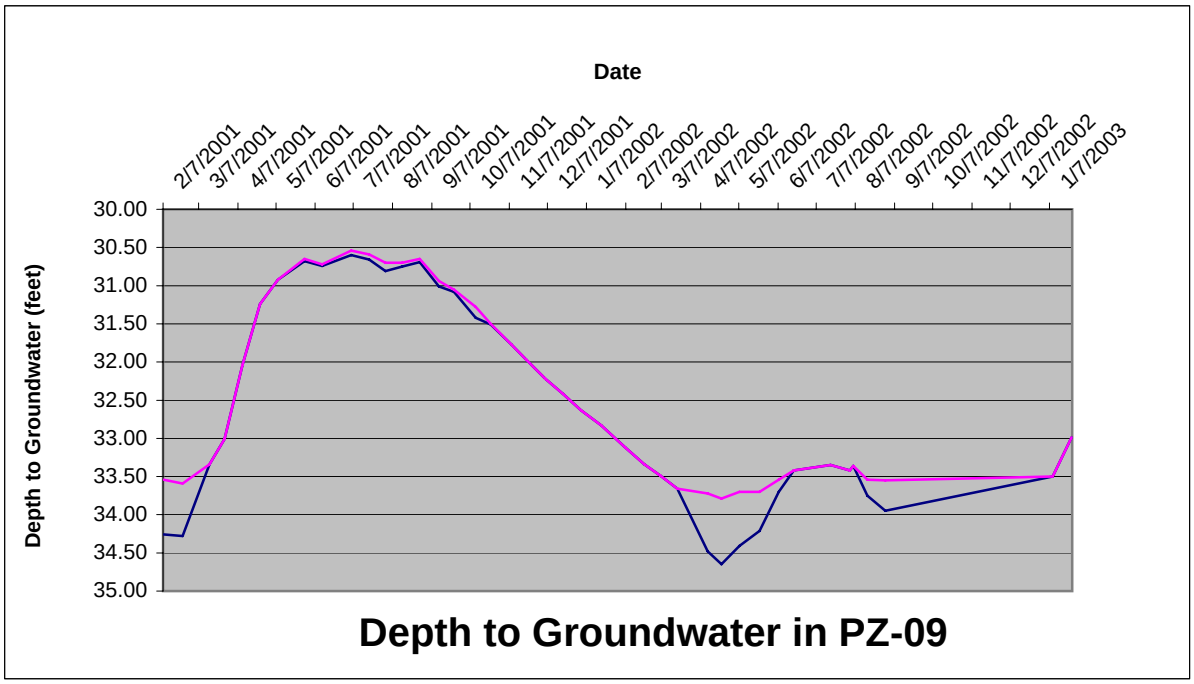
Depth to LNAPL measurement
Depth to water measurement
Where lines intersect no LNAPL present



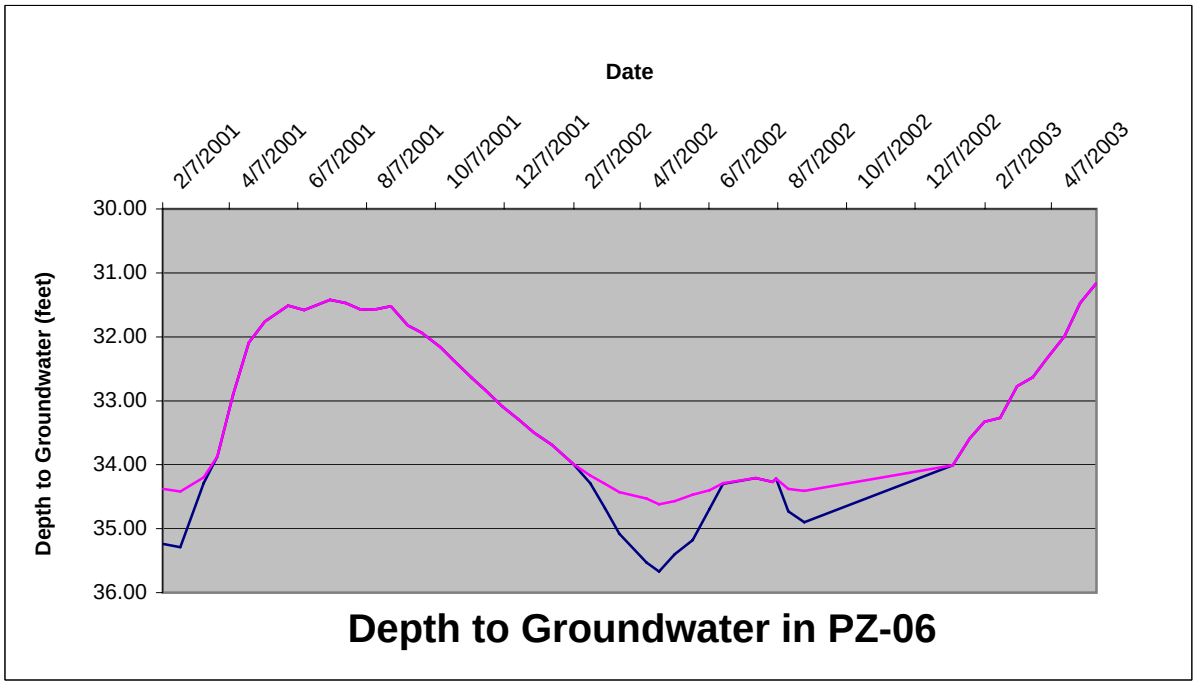
Depth to LNAPL measurement
Depth to water measurement
Where lines intersect no LNAPL present



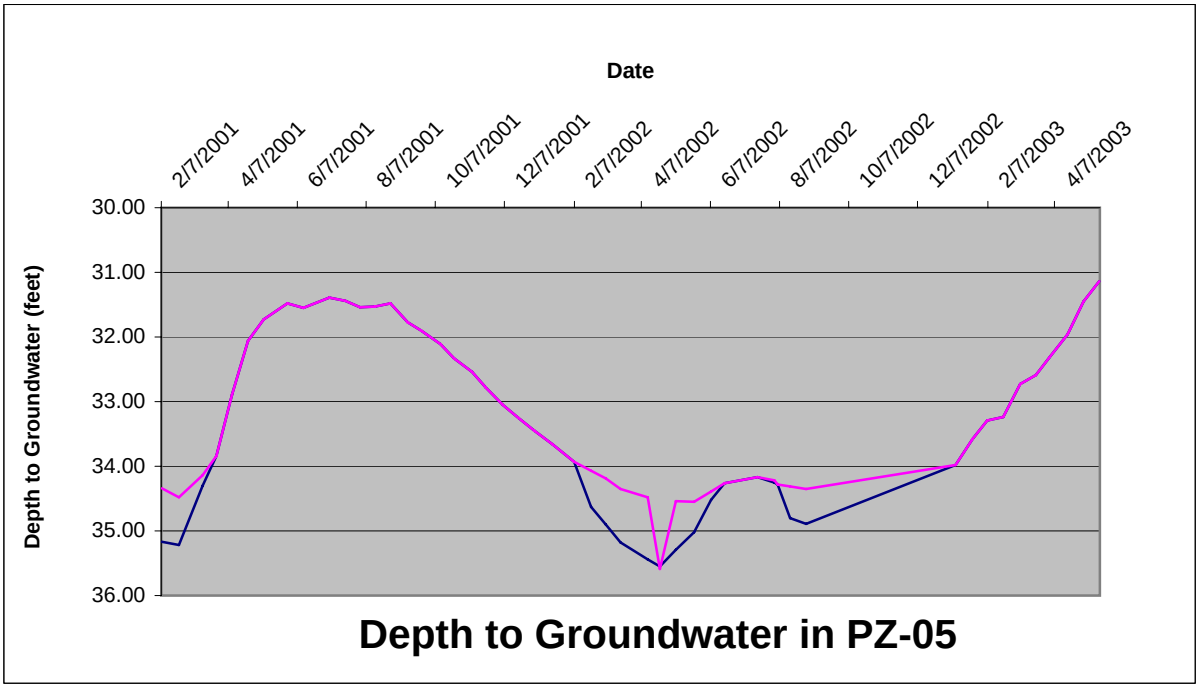
Depth to LNAPL measurement
Depth to water measurement
Where lines intersect no LNAPL present



Depth to LNAPL measurement
Depth to water measurement
Where lines intersect no LNAPL present



Depth to LNAPL measurement
Depth to water measurement
Where lines intersect no LNAPL present



Depth to LNAPL measurement
Depth to water measurement
Where lines intersect no LNAPL present

APPENDIX B
SITE PHOTOGRAPHS

APPENDIX C
SUFFOLK COUNTY SANITARY CODE
PUMPOUT & SOIL CLEANUP CRITERIA
AND CERTIFICATION OF SEWAGE DISPOSAL SYSTEM ABANDONEMENT FORM



Photo 1 – Former Baumann Bus site, existing conditions



Photo 2 – Former Baumann Bus site, existing conditions



Photo 3 – Former Baumann Bus site, existing conditions



Photo 4 – Former oil-water separator (under tarp)

Standard Operating Procedure For The Administration Of Article 12 Of The Suffolk County Sanitary Code

SOP No. 9-95 - *Pumpout And Soil Cleanup Criteria*

(January 7, 1999)

Statement of Purpose:

Article 12 of the Suffolk County Sanitary Code, requires the owner, operator or any other person in possession or control of an industrial facility to report to the Department of Health Services (the Department) any unauthorized discharge, leak or spill of toxic or hazardous material within two hours of knowledge of that discharge, leak or spill. Knowledge includes information generated during Phase I and Phase II Environmental Assessments, such as results from groundwater and soil sampling. In addition, Article 12 requires the owner, or any other person in possession or control of the source of the discharge, and/or the owner of the property onto which the discharge has occurred, to immediately cease the discharge and to reclaim, recover and dispose of the discharged material and to restore the environment to the condition that existed prior to the discharge. Since it is not always possible to achieve pre-discharge conditions, this document was generated to provide guidance when evaluating the potential impact of a discharge on the environment and to provide assistance when determining if, and to what extent, contaminated liquids and/or solids must be removed from sanitary systems, storm drains, the surface of the ground, or other locations at a facility. It was generated to be applicable to most situations; however, the Department reserves the right to apply additional requirements when warranted by conditions encountered at a particular site.

This document is not meant to represent approval by the Department of any remedial activities, or to represent the Department's determination that a site either does or does not require remediation. All spills, leaks, or discharges of toxic or hazardous materials, as defined by §760-1203 of the Sanitary Code, must be reported to the Office of Pollution Control, which will have the sole authority to make the determination as to what, if any, cleanup will be required. When assessing the need for cleanup at a specific site, the Department will consider all human health and environmental factors that are available. In many cases, site specific cleanup criteria may vary from the values listed in this SOP. Be advised that, in addition to meeting the Suffolk County Department of Health Services (SCDHS) requirements, the responsible party must meet the requirements of the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA).

Criteria:

Table 1 lists Action Levels and Cleanup Objectives for Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (Semi-VOCs) and heavy metals commonly found in both liquid and solid samples. When the concentration of a single contaminant, or a class of contaminants such as total petroleum hydrocarbons, meets or exceeds the "Action Level", a cleanup, or other action, is required.

As stated in the Sanitary Code, the goal of any remedial action required by this Department, is to return the site to pre-discharge conditions. If this is not possible, at a minimum, the cleanup must ensure reasonable protection for public health and the drinking water supply. Therefore, under most conditions, the contaminant concentration in the soil after a cleanup, should not exceed the values indicated in the "Cleanup Objective" column.

Table 1. Cleanup Criteria

SAMPLE TYPE	CONTAMINANT	ACTION LEVEL	CLEANUP OBJECTIVE
Liquid	Volatile Organics (VOCs) or Metals*	100 x Discharge Standard or 1000 ppb Total VOCs	(1)
Soil/Sludge	Volatile Organics (VOCs)	Appendix A or 15,000 ppb total VOCs.	Appendix A or 10,000 ppb total VOCs
	Metals*	Appendix B	Appendix B
	TPH	500 ppm (2)	500 ppm (2)
	Semi-VOCs	Appendix A	Appendix A

* Laboratory analysis for heavy metals must be performed by acid digestion for "total metals". TCLP, or other extraction methods, are not to be used for this purpose.

(1) - *Liquid Endpoint Samples*

Liquid endpoint samples must be collected when groundwater is encountered during a cleanup operation. If the concentration of VOCs, or metals, in the sample meets, or exceeds 100 times the discharge standard for a specific parameter, or the total VOC concentration meets, or exceeds 1000 ppb, a groundwater sample must be collected immediately downgradient of the point of contamination to determine if there has been an impact on the groundwater. If significant groundwater contamination is found, a more extensive groundwater investigation will be required. The Department reserves the right to require the installation of monitoring well(s) at lower contaminant levels based on the type of contaminant encountered and other site specific conditions.

(2) - Remediation Based on Total Petroleum Hydrocarbon (TPH) Concentration*.*

Although the analysis is not normally required by this Department, if TPH analysis is performed on a sample where all VOC and heavy metal parameters are within guidance values, and the TPH concentration is greater than, or equal to, 500 ppm, the responsible party must provide the Department with a semi-volatile (base/neutral) analysis of the effected soil. The results of this analysis will then be compared with the semi-volatile organic values listed in Appendix A, subject to a maximum allowable total semi-volatile concentration of 500 ppm. In summation, soil containing a TPH concentration below 500 ppm will normally be allowed to remain in place if no individual constituent meets, or exceeds its guidance value listed in either Appendix A or B, the total VOC concentration does not equal, or exceed 10 ppm and the material does not exhibit a petroleum odor.

NOTE: In order to perform an adequate environmental evaluation, the Department may, in certain instances, require additional analysis to be performed based on the chemicals stored, or in use, at a site. This can include TPH, cyanides, phenols, PCBs, pesticides and/or a more extensive list of heavy metals, VOCs and/or Semi-VOCs.

Other factors to be considered when evaluating a site :

In many instances, additional information is available which the Department will utilize when establishing cleanup goals, or action levels, for a specific site. Some factors that are considered when reviewing site specific conditions to decide if cleanup goals should be set higher or lower than the guidance values listed in this document include, but are not be limited to:

Site history - Past discharge practices, as well as the extent and type of discharge, should be evaluated.

Site location - If the facility is in a water sensitive area, more stringent cleanup goals may be warranted.

Distance to groundwater - This guidance document assumes a 100 fold reduction in contaminant concentration between the source area and the drinking water supply. If the distance between the contamination and the groundwater is less than three feet, or a drinking water supply well is located nearby, the guidance values listed may not provide adequate protection for the water supply.

Impact of discharge - If the Magothy aquifer, shallow drinking water wells or sensitive surface waters may be effected, more stringent cleanup criteria may be necessary.

TCLP analysis - If the listed cleanup objectives can not be obtained, TCLP analysis may provide assistance in determining site specific conditions and/or cleanup goals.

Monitoring well data - If groundwater degradation can be attributed to the contamination, more conservative cleanup goals should be established.

Future use of site - Although it is not this department's policy to allow pockets of contamination to remain in the ground throughout the county, in certain cases, where the cleanup objectives listed in this document can not be achieved, higher concentrations of contaminants may be allowed to remain in place if the site is to be stabilized in a manner acceptable to the Office of Pollution Control. In these instances, land, or deed, restrictions may be required.

APPENDIX A
CLEANUP OBJECTIVES AND ACTION LEVELS FOR VOLATILE ORGANICS (UG/KG)

(see note A-1)

Contaminant	Action Levels (ppb)	Cleanup Objectives (ppb)
Acetone	**	**
Benzene	120	60
Bromobenzene	1,600	800
Bromochloromethane	400	200
Bromodichloromethane	600	300
Bromoform	1000	500
n-Butylbenzene	6,800	3,400
sec-Butylbenzene	10,000	5,000
tert-Butylbenzene	6,800	3,400
CarbonTetrachloride	1,200	600
Chlorobenzene	3,400	1,700
Chloroethane	400	200
Chloroform	600	300
Chlorotoluene(s)	3,600	1,800
Dibromochloromethane	600	300
1,2-Dibromo-3-chloropropane	1,000	500
1,2-Dibromoethane	600	300
Dibromomethane	400	200

o-(1,2)-Dichlorobenzene	15,000	8,000
m-(1,3)-Dichlorobenzene	3,200	1,600
p-(1,4)-Dichlorobenzene	15,000	8,000
Dichlorodifluoromethane	600	300
1,1-Dichloroethane	400	200
1,2-Dichloroethane	200	100
1,1-Dichloroethene	800	400
cis-1,2-Dichloroethene	600	300
trans-1,2-Dichloroethene	600	300
1,2-Dichloropropane	600	300
1,3-Dichloropropane	600	300
2,2-Dichloropropane	600	300
1,1-Dichloropropene	600	300
cis-1,3-Dichloropropene	600	300
trans-1,3-Dichloropropene	600	300
p-Diethylbenzene	7,600	3,800
Ethylbenzene	11,000	5,500
p-Ethyltoluene	3,600	1,800
Freon113	12,000	6,000
Hexachlorobutadiene	15,000	10,000
Isopropylbenzene	5,200	2,600
p-Isopropyltoluene	7,800	3,900
MethyleneChloride	200	100
(MTBE)tert-Butylmethylether	1,200	600
Methylethylketone	600	300
Methylisobutylketone	2,000	1,000
Naphthalene	15,000	10,000
n-Propylbenzene	5,000	2,500
Styrene	2,000	1,000
1,1,1,2-Tetrachloroethane	600	300
1,1,2,2-Tetrachloroethane	1,200	600
Tetrachloroethene	2,800	1,400
1,2,4,5-Tetramethylbenzene	15,000	10,000
Toluene	3,000	1,500

1,2,3-Trichlorobenzene	6,800	3,400
1,2,4-Trichlorobenzene	6,800	3,400
1,1,1-Trichloroethane	1,600	800
1,1,2-Trichloroethane	600	300
Trichloroethene	1,400	700
Trichlorofluoromethane	1,600	800
1,2,3-Trichloropropane	800	400
1,2,4-Trimethylbenzene	4,800	2,400
1,3,5-Trimethylbenzene	5,200	2,600
VinylChloride	400	200
Xylene(s)	2,400	1,200

Semi-Volatile Organics

Contaminant	Action Levels (ppb)	Cleanup Objectives (ppb)
Acenaphthene	75,000	50,000
Anthracene	75,000	50,000
Benzo(a)anthracene	6,000*	3,000*
Benzo(b)fluoranthene	2,200*	1,100*
Benzo(k)fluoranthene	2,200*	1,100*
Benzo(g, h, i)perylene	75,000	50,000
Benzo(a)pyrene	22,000*	11,000*
Chrysene	800	400
Dibenzo(a,h)anthracene	75,000*	50,000*
Fluoranthene	75,000	50,000
Fluorene	75,000	50,000
Indeno(1,2,3-cd)pyrene	6,400	3,200
Phenanthrene	75,000	50,000
Pyrene	75,000	50,000

**If direct human exposure from ingestion or inhalation is a concern, the human health guidance values published by the USEPA should be used to formulate a cleanup goal, if that value is lower than the "Cleanup Objective" listed in this document.*

*** Due to its relatively short half life in nature, if acetone is the only contaminant of concern in a sample, the primary response should be to determine and*

eliminate the source of the acetone discharge. The requirement to perform a remediation will be determined on a case by case basis.

Note A-1: Organic contaminants were evaluated in a manner consistent with the New York State Department of Environmental Conservation's Technical and Administrative Guidance Memorandum, (TAGM) HWR-94-4046. Cleanup objectives were calculated using the following relationship, subject to maximum contaminant concentrations of 10 ppm for total VOCs, 50 ppm for individual semi-VOCs and 500 ppm total semi-VOCs. Action levels were generally set at twice the cleanup objective, subject to maximum contaminant concentrations:

$$\mathbf{C_s = (D)(f)(C_w)(K_{oc})}$$

Where:

C_s = Allowable Soil Concentrations (ppb)

D = Dilution Attenuation Factor of 100

f = organic fraction in soil (assumed to be 1%, or 0.01)

C_w = Water Quality Value (6NYCCR 703.5, or TOGS 1.1.1) in ppb

K_{oc} = Organic Carbon Partition Coefficient (an approximation of the propensity of a compound to adsorb to organic matter in the soil)

APPENDIX B

SOIL CLEANUP OBJECTIVES AND ACTION LEVELS FOR HEAVY METALS (MG/KG)

(see Note B-1)

Contaminant	Action Levels	Cleanup Objective	Background Concentrations Eastern USA
Arsenic	25.0	7.5	3.0 - 12
Beryllium	8.0	1.6	0.0 - 1.75
Cadmium	10.0	1.0	0.1 - 1
Chromium	100.0	10.0	1.5 - 40
Copper	500.0	25.0	1.0 - 50
Lead	400.0	100.0	4.0 - 61
Mercury	2.0	0.1	0.001 - 0.2
Nickel	1000.0	13.0	0.5 - 25
Silver	100.0	5.0	N/A

Note B-1: Certain metals, such as aluminum, iron and manganese, appear naturally in Long Island soils and are not considered to be significant under most conditions. Other metals will be evaluated on a case by case basis.

Suffolk County Department of Health Services
Office of Wastewater Management
Suffolk County Center
Riverhead, New York 11901
(631) 852-2100

CERTIFICATION OF SEWAGE DISPOSAL SYSTEM ABANDONMENT

Health Department Reference Number: _____

Suffolk Tax Map #: Dist: _____Sect(s)_____Blk(s)_____Lot(s)_____

Project Name or Address: _____

Subdivision Name & Lot #_____

Applicant Name:_____

I HEREBY CERTIFY THAT:

1. The first septic tank/leaching pool, from the foundation, was located and uncovered, **AND**
2. If liquid sewage was noted therein, was pumped dry by a licensed sewage hauler, **AND**
3. Tank/pool was inspected for outlet line to an overflow pool, **AND**
4. Overflow pool(s) was/were located, uncovered and items #2 and #3 were repeated until all parts of sanitary system were located, **AND**
5. All parts of sanitary system were removed or filled with clean backfill and any corbelled block domes collapsed.

I also certify that the sanitary system abandoned consisted of:

First tank/pool _____feet diameter_____ feet deep ( )precast ( )block ( ) other_____

First overflow pool_____feet diameter_____feet deep ( )precast ( )block ( ) other_____

Next overflow pool_____feet diameter_____feet deep ( )precast ( )block ( )other_____

Next overflow pool_____feet diameter_____feet deep ( )precast ( )block ( )other_____

Company which pumped out sanitary system if different from certifying company:
Name of Company:_____
Address:_____
Consumer Affairs License Number: _____

Contractor Signature:_____Date_____
Print Name/Company:_____Phone_____
Address:_____
Consumer Affairs License Number: _____

This certification <u>shall not</u> be used in lieu of inspections required by personnel of the Department and <u>may be</u> duplicated on company letterhead, provided it contains the above information.

APPENDIX D
LOW-FLOW PURGING AND SAMPLING PROCEDURE

Low Flow Purging and Sampling Procedure

1. Wear appropriate health and safety equipment as outlined in the Health and Safety Plan

2. Inspect each well for any damage or evidence of tampering and note condition in field logbook.

3. Remove the well cap.

4. Lay out plastic sheeting and place the monitoring, purging and sampling equipment on the sheeting. To avoid cross-contamination, do not let any downhole equipment touch the ground.

5. Measure well headspace with a PID or FID and record the reading in the field logbook.

6. Measure and record the depth to water and record the measurement in the field logbook. Do not measure the depth to the bottom of the well at this time (to avoid disturbing any sediment that may have accumulated). Obtain depth to bottom information from installation information in the field logbook or soil boring logs. Calculate volume of the water column.

7. Set the pump at approximately the middle of the screen. Be careful not to place the pump intake less than 2 feet above the bottom of the well as this may cause mobilization of any sediment present in the bottom of the well. Start pumping the well at 0.2 to 0.5 liters per minute.

8. Monitor the water level in the well periodically during pumping, and ideally the pumping rate should equal the well recharge rate with little or no water level drawdown in the well (drawdown shall be 0.3 foot or less). There should be at least 1 foot of water over the pump intake so there is no risk of the pump suction being broken, or entrapment of air in the sample. Record all pumping rate adjustments and depth(s) to water in the logbook. Pumping rates should, if needed, be reduced to the minimum capabilities of the pump (0.1 to 0.2 liters per minute) to avoid purging the well dry. However, if the recharge rate of the well is very low and the well is purged dry, then wait until the well has recharged to a sufficient level and collect the appropriate volume of sample with the submersible pump.

9. Purge the well at a low-flow rate (from 0.2 to 0.5 liters per minute). During purging, monitor the field parameters (temperature, pH, turbidity, specific conductance, and dissolved oxygen) approximately every 3 to 5 minutes. Purge a minimum of three well volumes.

10. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings, as follows:

    - ±0.1 for pH

- ±3 percent for specific conductance
- ±3 percent Temperature
- ±10 percent for dissolved oxygen
- ±10 percent for turbidity

Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

14. Once the field parameters have stabilized, collect the samples directly from the end of the tubing. Volatiles and analyses that degrade by aeration (e.g., hexavalent chromium) must be collected first. The bottles should be preserved and filled according to the procedures specified below and in the QAPP.

15. Fill all sample bottles by allowing the pump discharge to flow gently down the inside of the bottle with minimal turbulence. Cap each bottle as it is filled.

16. Preserve and label the samples, and record them on the chain of custody form. Place immediately into a cooler for shipment and maintain at 4°C.

18. Carefully remove the pump assembly from the well. The Teflon-lined polyethylene tubing will be dedicated to each well. The tubing should be placed in a large plastic garbage bag, sealed, and labeled with the appropriate well identification number.

19. After sampling is complete, measure the total depth of the well.

20. Close and lock the well.

APPENDIX E
HEALTH AND SAFETY PLAN

SUFFOLK COUNTY BAUMANN BUS SITE
AIRPORT DEVELOPMENT DISTRICT
GABRESKI AIRPORT, WESTHAMPTON BEACH, NY
SITE: #V-00576-1

HEALTH AND SAFETY PLAN

Submitted To:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Prepared For:

Suffolk County Department of Health Services
Office of Pollution Control
15 Horseblock Place
Farmingville, New York 11738

Prepared By:

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PWGC Project Number: DPW0703

MAY 2008

TABLE OF CONTENTS

STATEMENT OF COMMITMENT i

1.0 INTRODUCTION 2

1.1 Purpose 2
1.2 Scope 2
1.3 Application 3

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES 4

2.1 Project Manager 4
2.2 Field Team Leader (FTL)/ Site Health and Safety Officer (SHSO) 4
2.3 Health and Safety Manager 4
2.4 Site Personnel 4

3.0 SITE HISTORY AND PROJECT DESCRIPTION 5

3.1 Project Background 5
3.2 Site Location and Description 5

4.0 POTENTIAL HAZARDS OF THE SITE 6

4.1 Chemical Hazards 6
4.2 Biological Hazards 8
4.2.1 Animals 8
4.2.2 Insects 8
4.2.3 Plants 8
4.3 Physical Hazards 9
4.3.1 Temperature Extremes 9
4.3.2 Steam, Heat and Splashing 9
4.3.3 Noise 9
4.3.4 Fire and Explosion 9
4.3.5 Manual Lifting/Material Handling 9
4.3.6 Slips, Trips and Falls 10
4.3.7 Heavy Equipment Operation 10
4.3.8 Electrocution 10

5.0 ACTIVITY HAZARD ANALYSES 11

6.0 PERSONAL PROTECTIVE EQUIPMENT 12

6.1 Hazard Assessment for Selection of Personal Protective Equipment 12
6.2 Respirator Cartridge Change-Out Schedule 13

7.0 AIR MONITORING 14

8.0 ZONES, PROTECTION AND COMMUNICATION 15

8.1 Site Control 15
8.2 Contamination Control 15
8.2.1 Personnel Decontamination Station 15
8.3 Communication 16

9.0 MEDICAL SURVEILLANCE PROCEDURES 17

10.0 SAFETY CONSIDERATIONS 18

10.1 General Health and Safety Work Practices 18
10.2 The Buddy System 18
10.3 Sample Handling 18
10.4 Drill Rigs 18
10.4.1 Safety During Drilling Operations 18
10.5 Excavation 19

11.0 DISPOSAL PROCEDURES 20

12.0 EMERGENCY RESPONSE PLAN 21

12.1 Responsibilities 21
12.1.1 Health and Safety Manager (HSM) 21
12.1.2 Field Team Leader/Site Health and Safety Officer (FTL/SHSO) 21
12.1.3 Emergency Coordinator 21
12.1.4 Site Personnel 21
12.2 Communication 21
12.2.1 Hand Signals 21
12.2.2 Field Radios and Cell Phones 22
12.3 Local Emergency Support Units 22
12.4 Emergency Medical Treatment 22
12.5 Emergency Site Evacuation Routes and Procedures 23
12.6 Fire Prevention and Protection 23
12.6.1 Fire Prevention 23
12.7 Overt Chemical Exposure 24
12.8 Decontamination during Medical Emergencies 24
12.9 Accident/Incident Reporting 24
12.10 Adverse Weather Conditions 25
12.11 Spill Control and Response 25
12.12 Emergency Equipment 25

13.0 TRAINING 26

13.1 General Health and Safety Training 26
13.1.1 Three Day Supervised On the Job Training 26
13.2 Annual Eight-Hour Refresher Training 26
13.3 Site-Specific Training 26
13.4 On-Site Safety Briefings 26
13.5 First Aid 26

14.0 LOGS, REPORTS AND RECORDKEEPING 28

14.1 Medical and Training Records 28
14.2 Incident Report and Investigation Form 28
14.3 Health and Safety Logbooks 28

15.0 FIELD PERSONNEL REVIEW 29

LIST OF TABLES

4-1 CHEMICAL DATA 6
6-1 PERSONAL PROTECTIVE EQUIPMENT SELECTION 13
12-1 EMERGENCY TELEPHONE NUMBERS 26

LIST OF APPENDICES

APPENDIX A MATERIAL SAFETY DATA SHEETS
APPENDIX B ACTIVITY HAZARD ANALYSES
APPENDIX C HEAT/COLD STRESS PROTOCOLS
APPENDIX D GENERAL HEALTH AND SAFETY WORK PRACTICES
APPENDIX E HOSPITAL ROUTE MAP
APPENDIX F DAILY BRIEFING SIGN-IN SHEET
APPENDIX G INCIDENT REPORT FORM / INVESTIGATION FORM

STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to detail policies and procedures to prevent workers from exposure to chemical, biological, and physical hazards during the planned Supplemental Investigation (SI) activities to be performed at the Former Baumann Bus site, Westhampton Beach, New York. P.W. Grosser Consulting Inc.'s (PWGC's) policy is to minimize the possibility of work-related exposure through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this HASP. PWGC has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to persons present at the site who are actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical, biological and chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy.

1.0 INTRODUCTION

1.1 Purpose

This Health and Safety Plan (HASP) addresses the minimum health and safety practices that will be employed by site workers participating in Supplemental investigation (SI) activities at the project site located at the former Baumann Bus site, West Hampton Beach, New York.

The HASP takes into account the specific hazards inherent to the site and presents the minimum requirements which are to be met by P.W. Grosser Consulting, Inc. (PWGC), its subcontractors, and other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. PWGC sub-contractors will have the option of adopting this HASP or developing their own site-specific document. If a subcontractor chooses to prepare their own HASP, it must meet the minimum requirements as detailed in this HASP and must be made available to PWGC.

Activities performed under this HASP will comply with applicable parts of Occupational Safety and Health Administration (OSHA) Regulations, primarily 29 CFR Parts 1910 and 1926 and all other applicable federal, state, and local regulations. Modifications to the HASP may be made with the approval of the PWGC Health and Safety Manager (HSM) and/or Project Manager (PM). A copy of this HASP will be maintained on-site during work activities.

Refusal to comply with the HASP or violation of any safety procedures by field personnel may result in their immediate removal from the site following consultation with the HSM and the Field Team Leader (FTL)/Site Health and Safety Officer (SHSO).

1.2 Scope

This HASP addresses the potential hazards related to the SI activities. The primary SI activities include the following:

- Site Mobilization/Demobilization;
- Drilling/Excavation and;
- Soil and Groundwater Sampling

The potential hazards associated with this scope are listed below and are discussed in more detail in this HASP after the project organization and responsibilities section.

- Chemical Hazards
- Biological Hazards
- Physical Hazards

1.3 Application

The HASP applies to personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- PWGC employees and subcontractors;
- Client representatives; and
- Federal, state or local representatives.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the project organization and responsibilities.

2.1 Project Manager

- Participates in major incident investigations;
- Ensures that the HASP has required approvals before site work is conducted; and
- Has the overall project responsibility for project health and safety.

2.2 Field Team Leader (FTL)/ Site Health and Safety Officer (SHSO)

- Ensures that the HASP is implemented in conjunction with the Health and Safety Manager (HSM);
- Ensures that field work is scheduled with adequate equipment to complete the job safely;
- Enforces site health and safety rules;
- Ensures that proper personal protective equipment is utilized;
- Ensures that the HSM is informed of project changes that require modifications to the HASP;
- Ensures that the procedure modifications are implemented;
- Investigates incidents;
- Conducts the site safety briefing;
- Reports to HSM to provide summaries of field operations and progress; and
- Acts as Emergency Coordinator.

2.3 Health and Safety Manager

- Provides for the development of the HASP;
- Serves as the primary contact to review health and safety matters that may arise;
- Approves individuals who are assigned SHSO responsibilities;
- Coordinates revisions of this HASP with field personnel; and
- Assists in the investigation of major accidents.

2.4 Site Personnel

- Report any unsafe or potentially hazardous conditions to the FTL/SHSO;
- Maintain knowledge of the information, instructions and emergency response actions contained in this HASP; and
- Comply with rules, regulations and procedures as set forth in this HASP and any revisions.

3.0 SITE HISTORY AND PROJECT DESCRIPTION

3.1 Project Background

This Health and Safety Plan (HASP) has been prepared by PWGC, on behalf of Suffolk County.

Volatile organic compounds (VOCs) have been identified above guidance levels and/or standards in soil and/or groundwater at the site. The project will include environmental sampling activities to determine the extent of contamination in soil and groundwater at the site.

3.2 Site Location and Description

The Francis S. Gabreski Airport is located on County Road 31 in the Town of Southampton, New York and is owned by Suffolk County. The airport is located within the Long Island Pine Barrens which are characterized by open, sunlit woodlands dominated by pitch pine interspersed with white and scarlet oak. The nearby Quogue Wildlife Refuge is characterized by dwarf pitch pines ranging from 3 to 6 ft tall. The airport itself is characterized by surrounding wooded areas consisting of 25 ft pitch pines and scattered scrub oak. The Airport has no commercially scheduled service, but does support private planes and presently is the home of the 106th Rescue Wing of the New York Air National Guard (NYANG).

The Airport Development District (ADD) encompasses 58.6 acres of the Airport. The ADD is bounded to the north by the Airport service road, to the south by Cook Street, to the east by Sheldon Avenue and to the west by County Road 31. The area of concern within the ADD is the former Baumann Bus site, located at the former location of Building 140 at the northwest corner of Avenue B and Cook Street.

4.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the tasks specified under Section 1.0. Additional information can be found in **Appendix A** - Material Safety Data Sheets or in **Appendix B** - Activity Hazard Analyses.

4.1 Chemical Hazards

Review of historical information from the site indicates that the soil at the site is contaminated with petroleum related VOCs (i.e. ethylbenzene, isopropylbenzene, toluene, xylenes, naphthalene) which are present in groundwater (and potentially soil, as well) at concentrations exceeding applicable New York State Department of Environmental Conservation (NYSDEC) standards. These compounds may present an occupational exposure hazard during site operations.

Specific information on the chemicals identified at the Site can be found in Table 4-1 as well as on the Material Safety Data Sheets found in **Appendix A**.

TABLE 4-1
CHEMICAL DATA

COMPOUND	CAS#	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
Ethylbenzene	100-41-4	TWA 100 ppm (435 mg/m^3)	Inhalation Ingestion Skin/Eye	Irritating to the eyes, skin and respiratory tract. Swallowing may cause aspiration into the lungs with the risk of chemical pneumonitis. May cause effects on the CNS. Exposure far above the OEL could cause lowering of consciousness.	Skin, eyes, respiratory tract, CNS	Vapor pressure, 0.9 kPa Relative vapor density, 3.7 Colorless liquid with aromatic odor.
Isopropylbenzene	98-82-8	TWA 50 ppm (245 mg/m^3)	Inhalation Ingestion Skin/Eye	Irritating to the eyes and the skin. Swallowing may cause aspiration into the lungs with the risk of chemical pneumonitis. May cause effects on the CNS. Exposure far above the OEL may result in unconsciousness.	Skin, eyes, respiratory tract, CNS	Vapor pressure, 427 Pa Relative vapor density, 4.2 Colorless liquid with characteristic odor.
Toluene	108-88-3	TWA 200 ppm C 300 ppm	Inhalation Ingestion Skin/Eye	Irritating to the eyes and the respiratory tract. May cause effects on the CNS. If swallowed, aspiration into the lungs may result in chemical pneumonitis. Exposure at high levels may result in cardiac dysrhythmia and unconsciousness.	Skin, eyes, respiratory tract, CNS	Vapor pressure, 3.8 kPa Relative vapor density, 0.87 Colorless liquid with characteristic odor.
Xylenes	1330-20-7	TWA 100 ppm (435 mg/m^3)	Inhalation Ingestion Skin/Eye	Irritating to the eyes and the skin. May cause effects on the CNS. If swallowed, aspiration into the lungs may result in chemical pneumonitis.	Skin, eyes, respiratory tract, CNS	Vapor pressure, 0.8 kPa Relative vapor density, 0.8 Colorless liquid with characteristic odor.

Abbreviations

C = Ceiling limit, not to be exceeded
CNS = Central Nervous System
PEL=Permissible Exposure Limit
TWA = Time-weighted average (8 hours)
OSHA = Occupational Safety and Health Administration
ppm = parts per million
BP = Boiling Point

4.2 Biological Hazards

The site is currently unimproved and vacant. Potential exists for workers to come into contact with biological hazards such as animals, insects and plants. The Activity Hazard Analyses found in **Appendix B** includes specific hazards and control measures for each task, if applicable.

4.2.1 Animals

The Site is located in a predominantly commercial area. However, it is possible that white tailed deer, raccoon, foxes, possum, dogs, cats, rats and mice may be present. Workers shall use discretion and avoid contact with animals.

4.2.2 Insects

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents and PPE, if deemed necessary, when working in areas where insects are expected to be present.

During the months of April through October, particular caution must be exercised to minimize exposure to deer ticks and the potential for contracting Lyme disease. Specific precautionary work practices that are recommended include the following:

- Cover your body as much as possible. Wear long pants and long sleeved shirts. Light color clothing makes spotting of ticks easier.

- Try to eliminate possible paths by which the Deer Tick may reach unprotected skin. For example, tuck bottoms of pants into socks or boots and sleeves into gloves. (Duct tape may be utilized to help seal cuffs and ankles). If heavy concentrations of ticks or insects are anticipated or encountered, Tyvek coveralls may be utilized for added protection when the potential for heat stress is not a concern.

- Conduct periodic and frequent, (e.g., hourly), surveys of your clothing for the presence of ticks. Remove any tick, save it and report to the clinic with the tick.

- Use insect/tick repellents that contain the chemical DEET (n,n-Diethyltoluamide). Apply repellents in accordance with manufacturers' recommendations. These repellents are readily available and include such brands as Deep Woods OFF and Maximum Strength OFF.

4.2.3 Plants

Poison ivy, poison sumac and oak may be present at the site. The FTL/SHSO should identify the susceptible individuals. Worker shall avoid contact with these plants.

4.3 Physical Hazards

Most safety hazards are discussed in the Activity Hazard Analyses (AHA) in **Appendix B** for the different phases of the project. In addition to the AHAs, general work rules and other safety procedures are described in Section 10 of this HASP.

4.3.1 Temperature Extremes

Heat Stress

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke.

Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, and poor judgment.

PWGC's Heat/Cold Stress Protocols are specified in **Appendix C**.

4.3.2 Steam, Heat and Splashing

Exposure to steam/heat/splashing hazards can occur during steam cleaning activities. Splashing can also occur during well development and sampling activities. Exposure to steam/heat/splashing can result in scalding/burns, eye injury, and puncture wounds.

4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, drill rigs, pumps and engines. Workers will wear hearing protection while in the work zone when these types of machinery are operating.

4.3.4 Fire and Explosion

When conducting excavation or drilling activities, the opportunity of encountering fire and explosion hazards may exist from encountering underground utilities, from the use of diesel engine equipment, and other potential ignition sources. During dry periods there is an increased chance of forest and brush fires starting at the job site. If these conditions occur no smoking will be permitted at the site and operations involving potential ignition sources will be monitored continuously (fire watch).

4.3.5 Manual Lifting/Material Handling

Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common work place injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

4.3.6 *Slips, Trips and Falls*

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from rough terrain, surfaces that are steep inclines, surfaced debris, or surfaces which are wet from rain or ice. Falls may result in twisted ankles, broken bones, head trauma or back injuries.

4.3.7 *Heavy Equipment Operation*

A backhoe excavator/bobcat may be used to excavate contaminated soils and a Geoprobe will be used to install soil borings and groundwater sampling points. Working with or near heavy equipment poses many potential hazards, including electrocution, fire/explosion, being struck by or against, or pinched/caught/crushed by, and can result in serious physical harm.

4.3.8 *Electrocution*

Encountering underground utilities may pose electrical hazards to workers. Additionally, overhead electrical lines can be a concern during drilling operations. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

5.0 ACTIVITY HAZARD ANALYSES

The Activity Hazard Analysis (AHA) is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control and mitigate those hazards. The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

AHAs have been developed by PWGC for the following phases of work:

1. Site Mobilization/Demobilization;
2. Excavation/Drilling;
3. Soil and Groundwater sampling; and
4. Decontamination

Copies of these AHAs are included in **Appendix B** of this HASP.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) specified in **Table 6-1** represents the hazard analysis and PPE selection required by 29 CFR 1910.132. Specific information on known potential hazards can be found under Section 4.0 and **Appendix B** - Activity Hazard Analyses. For the purposes of PPE selection, the HSM and FTL/SHSO are considered competent persons. The signatures on the approval page of the HASP constitute certification of the hazard assessment. For activities not covered by **Table 6-1**, the FTL/SHSO will conduct the hazard assessment, select the PPE, and document changes in the appropriate field logs. PPE selection will be made in consultation with the HSM.

Modifications for initial PPE selection may also be made by the FTL/SHSO in consultation with the HSM and changes documented accordingly. If major modifications occur, the HSM will notify the PM.

PPE Abbreviations

HEAD PROTECTION
HH = Hard Hat

HEARING PROTECTION
EP = ear plugs
EM = ear muffs

EYE/FACE PROTECTION
APR = Full Face Air Purifying Respirator
MFS = Mesh Face shield
PFS =Plastic Face shield
SG = ANSI approved safety glasses with side shields

FOOT PROTECTION
Neo = Neoprene
OB = Overboot
Poly = polyethylene coated boot
Rub = rubber slush boots
STB = Leather work boots with steel toe

HAND PROTECTION
Cot = cotton
But = Butyl
LWG = Leather Work Gloves
Neo = Neoprene
Nit = Nitrile
Sur = Surgical

BODY PROTECTION
WC = work clothes
Cot Cov = Cotton Coveralls
Poly = Polyethylene coated Tyvek® coveralls
Saran = Saranex coated coveralls
Tyvek® = Uncoated Tyvek® coveralls

RESPIRATORY PROTECTION
APR = Full-face air purifying respirator with organic vapor cartridges
ASR = Full face air supplied respirator with escape bottle
SCBA = Self-contained breathing apparatus

6.1 Hazard Assessment for Selection of Personal Protective Equipment

The initial selection of personal protective equipment for each task was done by performing a hazard assessment taking into consideration the following:

- Potential chemical and physical hazards present;
- Work operations to be performed;
- Potential routes of exposure;
- Concentrations of contaminants present; and
- Characteristics, capabilities and limitations of PPE and any hazard that the PPE presents or magnifies.

A review of the analytical data from previous sampling events indicates that heavy meatals identified in **Table 4-1** are the primary contaminants of concern.

The exposure routes for these chemicals are inhalation, skin absorption, skin/eye contact and ingestion. Chemical protective gloves will be required for activities that involve sample handling and the likelihood for skin contact. The proper use of PPE and strict adherence to decontamination and personal hygiene procedures will effectively minimize skin contact and ingestion as potential routes of exposure.

TABLE 6-1
PERSONAL PROTECTIVE EQUIPMENT SELECTION

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Mobilization/ Demobilization	HH	SG	STB	WG	WC	None	None
Excavation, loading and backfilling	HH	SG	STB	WG	WC	EM or EP	None initially APR if action levels exceeded
Drilling Activities	HH	SG	STB	WG	WC	EM or EP	None initially APR if action levels exceeded
Soil/GW sampling	HH	SG	STB	WG, Nit & Sur as needed	WC, Tyvek® as needed	None	None initially APR if action levels exceeded
Decontamination	HH	SG	STB	Nit + Sur	WC, Tyvek® as needed	None	None initially APR if action levels exceeded

6.2 Respirator Cartridge Change-Out Schedule

A respirator cartridge change-out schedule has been developed in order to comply with 29 CFR 1910.134. If the use of respirators is necessary, the respirator cartridge change-out schedule for this project will be as follows:

1. Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first; and
2. If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.

Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short of time period they were used the day before.

7.0 AIR MONITORING

Air monitoring will be performed for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities at the site. Air monitoring will be used to help to confirm that the remedial work will not spread contamination off-site through the air. The primary concerns for this site are dust particulates. Although no VOCs have been reported during previous sampling events at the site monitoring with a photo-ionization detector (PID) will be performed during any invasive activities.

Real-time monitoring for dust and VOCs will be conducted both within the work area, and along the site perimeter, during intrusive activities such as excavation and drilling activities.

Level D level of protection will be utilized unless dust monitoring exceeds concentrations greater than 150 µg/m3 over daily background or PID readings in excess of 5.0 ppmv in the breathing zone are detected.

Detailed information on the types, frequency and location of real-time monitoring and community air monitoring requirements are provided in the Community Air Monitoring Plan prepared for this project.

8.0 ZONES, PROTECTION AND COMMUNICATION

8.1 Site Control

Site zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized, as appropriate. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin.

TThe zones are based upon current knowledge of proposed site activities. It is possible that the zone configurations may be altered or reduced due to work plan revisions. Should this occur, the work zones will be adjusted accordingly, and documented in the field logbook.

The following shall be used for guidance in revising these preliminary zone designations, if necessary.

Support Zone - The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - Activities which may involve exposure to site contaminants, hazardous materials and/or conditions, should be considered an EZ. The FTL/SHSO may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the site FTL/SHSO allowing adequate space for the activity to be completed, field members and emergency equipment.

8.2 Contamination Control

Decontamination areas will be established for the following activities.

- Drilling Activities

8.2.1 Personnel Decontamination Station

Personnel and portable equipment used in the EZ shall be subject to a thorough decontamination process, as deemed necessary by the FTL/SHSO. Sampling equipment shall be decontaminated. As necessary, boots and gloves will be decontaminated using soap and water solution and scrub brushes or by simple removal and

disposal. Used respiratory protective equipment will be decontaminated daily and sanitized with appropriate sanitizer solution.

Drums generated as a result of sampling and decontamination activities will be marked and stored at a designated area at the site until the materials can be property disposed of off-site. Non-expendable sampling equipment will be decontaminated. This usually entails the use of Alconox, solvent and distilled/deionized water rinses to eliminate contaminants.

8.3 Communication

- Each team member will have a Nextel cell phone/radio for communication with the PM, FTL/SHSO and other team members during field activities.

- Hand Signals - Hand signals shall be used by field teams, along with the buddy system. The entire field team shall know them before operations commence and their use covered during site-specific training. Typical hand signals are the following:

SIGNAL	MEANING
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist.	Leave the area immediately, no debate.
Hands on top of head	Need assistance
Thumbs up	Okay, I'm all right, I understand.
Thumbs down	No, negative.

9.0 MEDICAL SURVEILLANCE PROCEDURES

Contractor and subcontractor personnel performing field work where potential exposure to contaminants exists at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f).

10.0 SAFETY CONSIDERATIONS

10.1 General Health and Safety Work Practices

A list of general health and safety work practices is included as an included in **Appendix D**. The work rules will be posted in a conspicuous location at the site.

10.2 The Buddy System

At a minimum, employees shall work in groups of two in such a manner that they can observe each other and maintain line-of-sight for each employee within the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

10.3 Sample Handling

Personnel responsible for the handling of samples should wear the prescribed level of protection. Samples should be identified as to their hazard and packaged as to prevent spillage or breakage. Sample containers shall be decontaminated in the CRZ or EZ before entering a clean Support Zone area. Any unusual sample conditions, odors, or real-time readings should be noted. Laboratory personnel should be advised of sample hazard level and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling, in order to assure that the practices are appropriate for the suspected contaminants in the sample.

10.4 Drill Rigs

When conducting drilling activities, the opportunity of encountering fire and explosion hazards exists from underground utilities and gases. The locations of underground utilities will be verified prior to performing any intrusive activities. Additionally, because of the inherently hazardous nature of drilling operations, safety and accident prevention are crucial when drilling operations are performed. Most drilling accidents occur as a direct result of lack of training and supervision, improper handling of equipment, and unsafe work practices. Hazards include: assembling and disassembling rigs, rotary and auger drilling, and grouting. The drilling contractor shall perform drilling in accordance with its own Health & Safety Program for Drill Rig Safety.

10.4.1 Safety During Drilling Operations

- Safety requires the attention and cooperation of every worker and site visitor.
- Do not drive the drill rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast (derrick), look up to check for overhead obstructions.
- Maintain a minimum of 15 feet clearance from overhead electric lines.
- Before raising the mast (derrick), drill rig personnel (with the exception of the operator) and visitors shall be cleared from the areas immediately to the rear and the sides of the mast. Drill rig personnel and visitors shall be informed that the mast is being raised prior to raising it.
- Before the mast (derrick) of a drill rig is raised and drilling is commenced, the drill rig must first be leveled and stabilized with leveling jacks and/or solid cribbing. Lower the mast (derrick) only when the leveling jacks are down and do not raise the leveling jack pads until the mast (derrick) is lowered completely.
- The operator of a drill rig shall only operate a drill rig from the position of the controls.

- Throwing or dropping tools shall not be permitted. Tools shall be carefully passed by hand between personnel or a hoist line shall be used.
- Do not consume alcoholic beverages or other depressants or chemical stimulants prior to starting work on a drill rig or while on the job.
- Unattended boreholes must be adequately covered or otherwise protected to prevent drill rig personnel, site visitors, or animals form stepping or falling into the hole.
- Terminate drilling operations during an electrical storm and move the entire crew away from the drill rig.

10.5 Excavation

Excavations will be conducted in accordance with the requirements contained in 29 CFR 1926, Subpart P-Excavations. It provides for the designation of a "Competent Person" and general requirements for safe excavating practices. The program also incorporates company standards for the monitoring of potentially hazardous atmospheres; protection from water hazards; analyzing and maintaining the stability of adjacent structures; daily competent person inspections; soil classification; sloping and benching; protective systems; and training.

The Competent Person will be the FTL or other designee with appropriate training and experience. The Competent Person will be assisted in his/her duties by other technical personnel such as the HSM, geologists, structural engineers and soils engineers.

No entry into test pit excavations will be allowed for this phase of the project.

11.0 DISPOSAL PROCEDURES

Discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site.

Potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. Non-contaminated materials will be collected and bagged for appropriate disposal as non-hazardous solid waste. Additional waste disposal procedures may be developed as applicable.

12.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff is essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, and preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

12.1 Responsibilities

12.1.1 Health and Safety Manager (HSM)

The HSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that pre-emergency requirements are met. The HSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

12.1.2 Field Team Leader/Site Health and Safety Officer (FTL/SHSO)

The FTL/SHSO is responsible for ensuring that personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The FTL/SHSO is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that OSHA is notified within the required time frame. The HSM will be notified of OSHA recordable injuries, fires, spills, releases or equipment damage in excess of $500 within 24 hours.

12.1.3 Emergency Coordinator

The Emergency Coordinator for the project is the FTL/SHSO.

The emergency coordinator will locate emergency phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator will implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action.

12.1.4 Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

12.2 Communication

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

12.2.1 Hand Signals

Downrange field teams will employ hand signals where necessary for communication during emergency situations. Hand signals are found in Section 8.3.

12.2.2 Field Radios and Cell Phones

PWGC field personnel are provided Nextel cellular phones with telephone and two-way radio capabilities for site communication and emergency use.

12.3 Local Emergency Support Units

A route map from the site to the nearest hospital can be found in **Appendix E**. This map will be placed with the above emergency telephone numbers in on-site vehicles.

12.4 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the FTL/SHSO immediately. First aid equipment will be available on site at the following locations:

First Aid Kit: Support Zone (or designated by FTL/SHSO upon arrival)

During site-specific training, project personnel will be informed of the location of the first aid station(s) that has been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance. **A map and directions to the hospital can be found in Appendix E.**

TABLE 12-1
EMERGENCY TELEPHONE NUMBERS

Contact	Firm or Agency	Telephone Number
Police		911
Fire		911
Hospital	Peconic Bay Medical Center	(631) 548-6000
Ambulance		911
Project Manager/Health and Safety Manager	Andrew Lockwood - PWGC	(631) 589-6353
Site Health & Safety Officer	Tom Melia - PWGC	(631) 589-6353
NYSDEC Site Contact	Kerry Maloney	(518) 402-9625
Poison Control Center		(800) 962-1253
Chemtrec(for spills)		(800) 424-9300
SCDHS Site Contact	Jim Meyers	(631) 854-2529

12.5 Emergency Site Evacuation Routes and Procedures

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of emergency response activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the EC also may order the closure of the site for an indefinite period.

Project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, the EC will notify site personnel. Heavy equipment will be shut down and personnel will evacuate the work areas and assemble at the evacuation meeting point, which will be determined upon arrival at the site by the FTL/SHSO, prior to work beginning. This will then be conveyed to crew members during the site-specific briefing.

The EC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during an emergency. He/she will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

The EC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation.

12.6 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for a single continuous blast), and notification of local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

12.6.1 Fire Prevention

Adhering to the following precautions will prevent fires:

- Good housekeeping and storage of materials;
- Storage of flammable liquids and gases away from oxidizers;
- No smoking in the exclusion zone or any work area;
- No hot work without a properly executed hot work permit;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;
- Use of UL approved flammable storage cans;
- Fire extinguishers rated at least 10 pounds ABC located on heavy equipment, in trailers and near hot work activities; and
- Monthly inspections of fire extinguishers.

12.7 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Material Safety Data Sheet or recommended by the Corporate Medical Consultant will be followed, when necessary.

SKIN AND EYE CONTACT: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.

INHALATION: Move to fresh air. Decontaminate and transport to hospital or local medical provider.

INGESTION: Decontaminate and transport to emergency medical facility.
PUNCTURE WOUND OR LACERATION: Decontaminate and transport to emergency medical facility.

12.8 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The FTL/SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on-site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

12.9 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

- Health and Safety Manager;
- Project Manager; and
- The employer of any injured worker who is <u>not</u> a PWGC employee.

Written confirmation of verbal reports are to be completed by the FTL/SHSO using the Incident Report Form and submitted within 24 hours. The incident report and investigation form is found in **Appendix G**. If the employee involved is not a PWGC employee, his employer will receive a copy of the report.

12.10 Adverse Weather Conditions

In the event of adverse weather conditions, the FTL/SHSO will determine if work can continue without potentially risking the safety of field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries;
- Potential for cold stress and cold-related injuries;
- Treacherous weather-related working conditions (hail, rain, snow, ice, high winds);
- Limited visibility (fog);
- Potential for electrical storms;
- Earthquakes; and
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The FTL/SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

12.11 Spill Control and Response

Small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. Spill containment materials will be properly disposed. An exclusion zone of 50 to 100 feet around the spill area should be established depending on the size of the spill. The following seven steps should be taken by the Emergency Coordinator:

- Determine the nature, identity and amounts of major spill components;
- Make sure unnecessary persons are removed from the spill area;
- Notify appropriate response teams and authorities;
- Use proper PPE in consultation with the FTL/SHSO;
- If a flammable liquid, gas or vapor is involved, remove ignition sources and use non-sparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
- If possible, try to stop the leak with appropriate material; and,
- Remove surrounding materials that can react or compound with the spill.

12.12 Emergency Equipment

At a minimum, an industrial first aid kit and fire extinguishers (one per work area) shall be kept and maintained on-site during work activities.

13.0 TRAINING

13.1 General Health and Safety Training

In accordance with PWGC corporate policy, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical).

13.1.1 Three Day Supervised On the Job Training

In addition to the required initial hazardous waste operations training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

13.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 1910.120 requirements and related company programs and procedures.

13.3 Site-Specific Training

Prior to commencement of field activities, field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site, and will highlight provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

13.4 On-Site Safety Briefings

Project personnel and visitors will be given on-site health and safety briefings daily by the FTL/SHSO to assist site personnel in safely conducting their work activities. A copy of the Daily Briefing Sign-In Sheet is contained in **Appendix F**.

Briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. Briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. Meetings will also be an opportunity to periodically update the crews on monitoring results. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for crew members involved in the activity.

13.5 First Aid

The HSM will identify those individuals requiring first aid training so that emergency medical treatment is available during field activities. It is anticipated that a minimum of one field person on-site at any one time will have first aid

training. The training will be consistent with the requirements of the American Red Cross Association or American Heart Association. If none are available on-site, then the HSM shall be notified.

14.0 LOGS, REPORTS AND RECORDKEEPING

Changes to the HASP will be documented in the Health and Safety log book and as appropriate, the HSM and/or PM will be notified. Daily tailgate meetings will be documented in the H&S log book as well as personnel on-site.

14.1 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, site-specific training and documentation of three day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained by the HSM. Records for subcontractor employees will also be maintained by the HSM.

14.2 Incident Report and Investigation Form

The incident report and investigation form is to be completed for each accident and incident, including near misses. The form can be found in **Appendix G**.

14.3 Health and Safety Logbooks

The FTL/SHSO will maintain a logbook during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. Logbooks will become part of the exposure records file.

15.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of the HASP. It is maintained on site by the FTL/SHSO as a project record. Each field team member shall sign this section after site-specific training is completed and before being permitted to work on site.

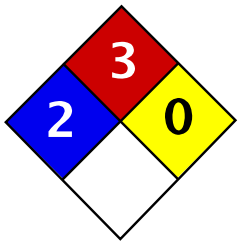
I have read, or have been informed of, the Health and Safety Plan and understand the information presented. I will comply with the provisions contained therein.

Name (Print and Sign)	Date

APPENDIX A

MATERIAL SAFETY DATA SHEETS





Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ethylbenzene	100-41-4	100

Toxicological Data on Ingredients: Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant, sensitizer).
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 432°C (809.6°F)

Flash Points:
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001)
CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001)
CLOSED CUP: 21 C (70 F) (NFPA)

Flammable Limits: LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Vapors may form explosive mixtures in air.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid.
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 125 (ppm) from OSHA (PEL) [United States]
TWA: 435 STEL: 545 from OSHA (PEL) [United States]
TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States]
TWA: 100 STEL: 125 (ppm) from NIOSH [United States]
TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States]
TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)]
TWA: 100 STEL: 125 (ppm) [Belgium]
TWA: 100 STEL: 125 (ppm) [Finland]
TWA: 50 (ppm) [Norway]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

Taste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in diethyl ether.
Very slightly soluble in cold water or practically insoluble in water.
Soluble in all proportions in Ethyl alcohol.
Soluble in Carbon tetrachloride, Benzene.
Insoluble in Ammonia.
Slightly soluble in Chloroform.
Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources (flames, sparks, static), incompatible materials, light

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials.
Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

Toxicity to Animals: Acute oral toxicity (LD50): 3500 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.
May cause damage to the following organs: central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc 50% Kill:
LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg
Lowest Published Lethal Dose/Conc:
LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data.
May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate.
May affect genetic material (mutagenic).

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Can cause mild skin irritation. It can be absorbed through intact skin.
Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS)
Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987).
Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene
Illinois toxic substances disclosure to employee act: Ethylbenzene
Illinois chemical safety act: Ethylbenzene
New York release reporting list: Ethylbenzene
Rhode Island RTK hazardous substances: Ethylbenzene
Pennsylvania RTK: Ethylbenzene
Minnesota: Ethylbenzene
Massachusetts RTK: Ethylbenzene
Massachusetts spill list: Ethylbenzene
New Jersey: Ethylbenzene
New Jersey spill list: Ethylbenzene
Louisiana spill reporting: Ethylbenzene
California Director's List of Hazardous Substances: Ethylbenzene
TSCA 8(b) inventory: Ethylbenzene
TSCA 4(a) proposed test rules: Ethylbenzene
TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97
SARA 313 toxic chemical notification and release reporting: Ethylbenzene

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable.
R20- Harmful by inhalation.
S16- Keep away from sources of ignition - No smoking.
S24/25- Avoid contact with skin and eyes.
S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References:
-Manufacturer's Material Safety Data Sheet.
-Fire Protection Guide to Hazardous Materials, 13th ed., National Fire Protection Association (NFPA)
-Registry of Toxic Effects of Chemical Substances (RTECS)
-Chemical Hazard Response Information System (CHRIS)
-Hazardous Substance Data Bank (HSDB)
-New Jersey Hazardous Substance Fact Sheet
-Ariel Global View
-Reprotext System

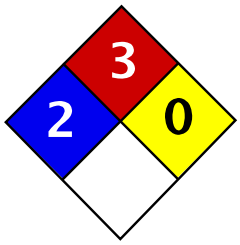
Other Special Considerations: Not available.

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Toluene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Toluene

Catalog Codes: SLT2857, SLT3277

CAS#: 108-88-3

RTECS: XS5250000

TSCA: TSCA 8(b) inventory: Toluene

CI#: Not available.

Synonym: Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

Chemical Name: Toluene

Chemical Formula: C6-H5-CH3 or C7-H8

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Toluene	108-88-3	100

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

Flammable Limits: LOWER: 1.1% UPPER: 7.1%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat.
Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide;

concentrated nitric acid, sulfuric acid + nitric acid; N_2O_4; $AgClO_4$; BrF_3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water.
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States]
TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN
TWA: 100 STEL: 150 from NIOSH [United States]
TWA: 375 STEL: 560 (mg/m^3) from NIOSH [United States]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweet, pungent, Benzene-like.

Taste: Not available.

Molecular Weight: 92.14 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 110.6°C (231.1°F)

Melting Point: -95°C (-139°F)

Critical Temperature: 318.6°C (605.5°F)

Specific Gravity: 0.8636 (Water = 1)

Vapor Pressure: 3.8 kPa (@ 25°C)

Vapor Density: 3.1 (Air = 1)

Volatility: Not available.

Odor Threshold: 1.6 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.7

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Soluble in diethyl ether, acetone.
Practically insoluble in cold water.
Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide.
Solubility in water: 0.561 g/l @ 25 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks, static), incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride.
Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C.
Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 636 mg/kg [Rat].
Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit].
Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.
May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose:
LDL [Human] - Route: Oral; Dose: 50 mg/kg
LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin.
Eyes: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. This usually resolves in 2 days.
Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia,), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite.
Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation.
Chronic Potential Health Effects:
Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophostatemia), severe, muscle weakness and Rhabdomyolysis.
Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may

arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Toluene UNNA: 1294 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene
California prop. 65 (no significant risk level): Toluene: 7 mg/day (value)
California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene
Connecticut hazardous material survey.: Toluene
Illinois toxic substances disclosure to employee act: Toluene
Illinois chemical safety act: Toluene
New York release reporting list: Toluene
Rhode Island RTK hazardous substances: Toluene
Pennsylvania RTK: Toluene
Florida: Toluene
Minnesota: Toluene
Michigan critical material: Toluene
Massachusetts RTK: Toluene
Massachusetts spill list: Toluene
New Jersey: Toluene
New Jersey spill list: Toluene
Louisiana spill reporting: Toluene
California Director's List of Hazardous Substances.: Toluene
TSCA 8(b) inventory: Toluene
TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92
SARA 313 toxic chemical notification and release reporting: Toluene
CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable.
R20- Harmful by inhalation.
S16- Keep away from sources of ignition - No smoking.
S25- Avoid contact with eyes.
S29- Do not empty into drains.
S33- Take precautionary measures against static discharges.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

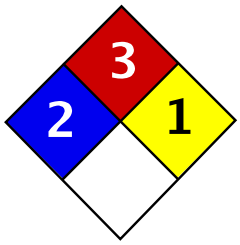
Other Special Considerations: Not available.

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Cumene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Cumene

Catalog Codes: SLC3052

CAS#: 98-82-8

RTECS: GR8575000

TSCA: TSCA 8(b) inventory: Cumene

CI#: Not available.

Synonym: Isopropyl benzene; Cumol; 2-Phenyl propane; (1-Methylethyl)benzene

Chemical Name: Isopropylbenzene

Chemical Formula: C6H5CH(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Cumene	98-82-8	100

Toxicological Data on Ingredients: Cumene: ORAL (LD50): Acute: 1400 mg/kg [Rat]. 12750 mg/kg [Mouse]. DERMAL (LD50): Acute: 12300 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Very hazardous in case of skin contact (permeator).
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to lungs, the nervous system, mucous membranes.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 424°C (795.2°F)

Flash Points: CLOSED CUP: 36°C (96.8°F). OPEN CUP: 44°C (111.2°F).

Flammable Limits: LOWER: 0.9% UPPER: 6.5%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid.
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 50 CEIL: 75 (ppm)
TWA: 245 CEIL: 365 (mg/m3)
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 120.2 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 152.4°C (306.3°F)

Melting Point: -96°C (-140.8°F)

Critical Temperature: Not available.

Specific Gravity: 0.862 (Water = 1)

Vapor Pressure: 8 mm of Hg (@ 20°C)

Vapor Density: 4.14 (Air = 1)

Volatility: Not available.

Odor Threshold: 1.2 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.7

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 1400 mg/kg [Rat].
Acute dermal toxicity (LD50): 12300 mg/kg [Rabbit].

Chronic Effects on Humans: The substance is toxic to lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans: Very hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Class 3: Flammable liquid.

Identification: : Isopropylbenzene : UN1918 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Cumene
Massachusetts RTK: Cumene
TSCA 8(b) inventory: Cumene
SARA 313 toxic chemical notification and release reporting: Cumene
CERCLA: Hazardous substances.: Cumene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

DSCL (EEC):
R10- Flammable.
R22- Harmful if swallowed.
R38- Irritating to skin.
R41- Risk of serious damage to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

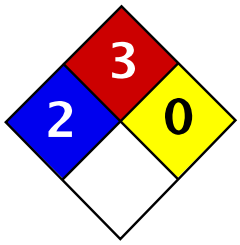
References: Not available.

Other Special Considerations: Not available.

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Last Updated: 02/26/2007 01:14 PM

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Xylenes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Xylenes

Catalog Codes: SLX1075, SLX1129, SLX1042, SLX1096

CAS#: 1330-20-7

RTECS: ZE2100000

TSCA: TSCA 8(b) inventory: Xylenes

CI#: Not available.

Synonym: Xylenes; Dimethylbenzene; xylol; methyltoluene

Chemical Name: Xylenes (o-, m-, p- isomers)

Chemical Formula: C6H4(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Xylenes	1330-20-7	100

Toxicological Data on Ingredients: Xylenes: ORAL (LD50): Acute: 4300 mg/kg [Rat]. 2119 mg/kg [Mouse]. DERMAL (LD50): Acute: >1700 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 24°C (75.2°F). (Tagliabue.) OPEN CUP: 37.8°C (100°F).

Flammable Limits: LOWER: 1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat.
Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Slightly explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Vapors may travel to source of ignition and flash back.

Special Remarks on Explosion Hazards:
Vapors may form explosive mixtures with air.
Containers may explode when heated.

May polymerize explosively when heated.
An attempt to chlorinate xylene with 1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin) caused a violent explosion

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid.
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 (ppm) [Canada]
TWA: 435 (mg/m3) [Canada]
TWA: 434 STEL: 651 (mg/m3) from ACGIH (TLV) [United States]
TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 138.5°C (281.3°F)

Melting Point: -47.4°C (-53.3°F)

Critical Temperature: Not available.

Specific Gravity: 0.864 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 1 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water.
Miscible with absolute alcohol, ether, and many other organic liquids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Store away from acetic acid, nitric acid, chlorine, bromine, and fluorine.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 2119 mg/kg [Mouse].

Acute dermal toxicity (LD50): >1700 mg/kg [Rabbit].
Acute toxicity of the vapor (LC50): 5000 4 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
May cause damage to the following organs: blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Lethal Dose:
LDL [Human] - Route: Oral; Dose: 50 mg/kg
LCL [Man] - Route: Oral; Dose: 10000 ppm/6H

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in animal. Embryotoxic and/or foetotoxic in animal.
May cause adverse reproductive effects (male and femael fertility (spontaneous abortion and fetotoxicity)) and birth defects based animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes skin irritation. Can be absorbed through skin.
Eyes: Causes eye irritation.
Inhalation: Vapor causes respiratory tract and mucous membrane irritation. May affect central nervous system and behavior (General anesthetic/CNS depressant with effects including headache, weakness, memory loss, irritability, dizziness, giddiness, loss of coordination and judgement, respiratory depression/arrest or difficulty breathing, loss of appetite, nausea, vomiting, shivering, and possible coma and death). May also affects blood, sense organs, liver, and peripheral nerves.
Ingestion: May cause gastrointestinal irritation including abdominal pain, vomiting, and nausea. May also affect liver and urinary system/kidneys. May cause effects similar to those of acute inhalation.
Chronic Potential Health Effects:
Chronic inhalation may affect the urinary system (kidneys) blood (anemia), bone marrow (hyperplasia of bone marrow) brain/behavior/Central Nervous system. Chronic inhalation may alsocause mucosal bleeding.
Chronic ingestion may affect the liver and metabolism (loss of appetite) and may affect urinary system (kidney damage)

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Xylenes UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Xylenes
Illinois chemical safety act: Xylenes
New York acutely hazardous substances: Xylenes
Rhode Island RTK hazardous substances: Xylenes
Pennsylvania RTK: Xylenes
Minnesota: Xylenes
Michigan critical material: Xylenes
Massachusetts RTK: Xylenes
Massachusetts spill list: Xylenes
New Jersey: Xylenes
New Jersey spill list: Xylenes
Louisiana spill reporting: Xylenes
California Director's List of Hazardous Substances: Xylenes
TSCA 8(b) inventory: Xylenes
SARA 302/304/311/312 hazardous chemicals: Xylenes
SARA 313 toxic chemical notification and release reporting: Xylenes
CERCLA: Hazardous substances.: Xylenes: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R10- Flammable.
R21- Harmful in contact with skin.
R36/38- Irritating to eyes and skin.
S2- Keep out of the reach of children.
S36/37- Wear suitable protective clothing and gloves.
S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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APPENDIX B

ACTIVITY HAZARD ANALYSES

Project Identification Baumann Bus	**Location** West Hampton, NY	**Estimated Dates** TBD
Phase of Work Mobilization/ Demobilization	**Page 1 of 1**	**Analysis Approved by** Andrew Lockwood, PM
TASKS	**HAZARDS**	**CONTROL MEASURES**
1. Mobilization and demobilization of equipment site tools, personnel	Slips/trips/falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and • Mark and repair if possible tripping hazards.
	Manual lifting and material handling	• Instruct personnel on proper lifting techniques; • Use proper lifting techniques; and • Team lifting will be used for heavy loads or use mechanical lifting devices.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and • Stay in visual and verbal contact with your buddy.
	Vehicular traffic	• Spotters will be used when backing up trucks and heavy equipment and when moving equipment.
	Overhead hazards	• Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; • Ground personnel will stay clear of suspended loads; • Equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and • Overhead hazards will be identified prior to commencing work operations.
	Noise	• Ear plugs or ear muffs shall be worn for operations that exceed 85 decibels.
	Electrocution	• Equipment will be equipped with GFCI; • A licensed electrician will conduct electrical work; • Equipment will stay a minimum of 15 feet from overhead-energized electrical lines (50 kV). This distance will increase .4 inches for each 1 kV above 50 kV.
	Biological hazards	• Be alert to the presence of biological hazards; • Wear insect repellent; • Follow procedures in Section 4.2.2 for tick bites; • FTL/SHSO should be aware of on-site personnel with allergic reactions in insect bites and stings.

Project Identification Baumann Bus	**Location** West Hampton, NY	**Estimated Dates** TBD
Phase of Work Excavation/Drilling	**Page 1 of 2**	**Analysis Approved by** Andrew Lockwood, PM
TASKS	**HAZARDS**	**CONTROL MEASURES**
1. Excavation 2. Drill to required depths and collect soil samples/install groundwater sampling points.	Chemical hazards	• Wear appropriate PPE per Table 6-1; • Perform air monitoring per Community Air Monitoring Plan; • Practice contamination avoidance; • Follow proper decontamination procedures; and • Wash hands/face before eating, drinking or smoking.
	Hand and power tool usage	• Equip electrical equipment with GFCI's; • Inspect electrical equipment and tools prior to use; • Daily inspections will be performed; • Remove broken or damaged tools from service; • Use the tool for its intended purpose; • Use in accordance with manufacturer instructions; and Tag and remove defective equipment.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and, • Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	• Instruct personnel on proper lifting techniques; • Use proper lifting techniques; and • Team lifting will be used for heavy loads or use mechanical lifting devices.
	Fire/Explosion	• ABC type fire extinguishers shall be readily available; • No smoking in work area.
	Biological hazards	• Be alert to the presence of biological hazards; • Wear insect repellent; • Follow procedures in Section 4.2.2 for tick bites; • FTL/SHSO should be aware of on-site personnel with allergic reactions in insect bites and stings.
	Heavy equipment	• Ground personnel will stay clear of suspended loads; • Ground personnel will stay out of the swing radius; • Eye contact with operators will be made before approaching equipment; • Equipment will not be approached on blind sides; • Equipment will be equipped with backup alarms or spotters shall be used.
	Slips/Trips/Falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and mark and repair if possible tripping hazards are present.

Project Identification Baumann Bus	**Location** West Hampton, NY	**Estimated Dates** TBD
Phase of Work Drilling	**Page 2 of 2**	**Analysis Approved by** Andrew Lockwood, PM
TASKS	**HAZARDS**	**CONTROL MEASURES**
	Noise	• Hearing protection mandatory at or above 85 dBA. • Instruct personnel how to properly wear heating protective devices. • Disposable ear plugs or other hearing protection required when working near noisy equipment..
	Steam/Heat/Splashing	• Use face shield and safety glasses or goggles; • Stay out of the splash/steam radius; • Do not direct steam at anyone; • Do not hold objects with your foot and steam area near it; • Direct spray to minimize spread of constituents of concern; and • Use shielding as necessary.
	Excavation hazards	• Follow 29 CFR 1926 Subpart P.
	Overhead hazards	• Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; • Ground personnel will stay clear of suspended loads; • Equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and • Overhead hazards will be identified prior to commencing work operations.

Project Identification Baumann Bus	**Location** West Hampton, NY	**Estimated Dates** TBD
Phase of Work Soil/Groundwater Sampling	**Page 1 of 1**	**Analysis Approved by** Andrew Lockwood, PM
TASKS	**HAZARDS**	**CONTROL MEASURES**
1.Collect soil/groundwater samples.	Chemical hazards	• Wear appropriate PPE per Table 6-1; • Practice contamination avoidance; • Follow proper decontamination procedures; and • Wash hands/face before eating, drinking or smoking.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and • Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	• Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available.
	Slips/Trips/Falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and • Mark and repair if possible tripping hazards.

Project Identification Baumann Bus	**Location** West Hampton, NY	**Estimated Dates** TBD
Phase of Work Decontamination	**Page 1 of 1**	**Analysis Approved by** Andrew Lockwood PM
TASKS	**HAZARDS**	**CONTROL MEASURES**
1.Decontaminate equipment	Chemical hazards	• Wear appropriate PPE per Table 6-1; • Practice contamination avoidance; • Follow proper decontamination procedures; and • Wash hands/face before eating, drinking or smoking.
	Temperature extremes	• Drink plenty of fluids: • Train personnel of signs/symptoms of heat/cold stress; • Monitor air temperatures when extreme weather conditions are present; and • Stay in visual and verbal contact with your buddy.
	Manual lifting and material handling	• Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; team lifting should be utilized if mechanical devices are not available.
	Slips/Trips/Falls	• Maintain alertness to slip/trip/fall hazards; • Maintain good housekeeping; • Walk, do not run; • Wear footwear with soles that grip; • Unloading areas should be on even terrain; and • Mark and repair if possible tripping hazards.

APPENDIX C

HEAT/COLD STRESS PROTOCOLS

HEAT STRESS

Heat Stress (Hyperthermia)

Heat stress is the body's inability to regulate the core temperature. A worker's susceptibility to heat stress can vary according to his/her physical fitness, degree of acclimation to heat, humidity, age and diet.

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.

3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.

4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. *Heat exhaustion* results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. *Treatment for heat exhaustion*: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.

7. *Heat stroke* results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.

8. *Treatment of heat stroke*: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

TABLE 1

SYMPTOMS OF HEAT STRESS

Heat cramps are caused by heavy sweating with inadequate fluid intake. Symptoms include;

- Muscle cramps
- Cramps in the hands, legs, feet and abdomen

Heat exhaustion occurs when body organs attempt to keep the body cool. Symptoms include;

- Pale, cool moist skin
- Core temperature elevated 1-2°
- Thirst
- Anxiety
- Rapid heart rate
- Heavy sweating
- Dizziness
- Nausea

Heat stroke is the most serious form of heat stress. Immediate action must be taken to cool the body before serious injury and death occur. Symptoms are;

- Red, hot, dry skin
- Lack of perspiration
- Seizures
- Dizziness and confusion
- Strong, rapid pulse
- Core temperature of 104° or above
- Coma

TABLE 2

HEAT STRESS INDICATORS

Heat stress indicator	When to measure	If Exceeds...	Action
Heart rate (pulse)	Beginning of rest period	110 beats per minute	Shorten next work period by 33%
Oral temperature	Beginning of rest period	99°F (after thermometer is under tongue for 3 minutes) 100.6°F	Shorten next work period by 33% Prohibit work in impermeable clothing
Body weight	1. Before workday begins (a.m.) 2. After workday ends (p.m.)		Increase fluid intake

COLD STRESS

Cold stress (Hypothermia)

In hypothermia the core body temperature drops below 95°F. Hypothermia can be attributed to a decrease in heat production, increased heat loss or both.

Prevention

Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 98.6°F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear gloves. Tool handles should be covered with insulating material.
3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.
6. Using a wind chill chart such as the one in Table 3, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

Frostbite

Personnel should be aware of symptoms of frostbite/hypothermia. If the following symptoms are noticed in any worker, he/she should immediately go to a warm shelter.

Condition	Skin Surface	Tissue Under Skin	Skin Color
Frostnip	Soft	Soft	Initially red, then white
Frostbite	Hard	Soft	White and waxy
Freezing	Hard	Hard	Blotchy, white to yellow-gray to gray

1. *Frostnip* is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.

2. *Treatment of frostnip*: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.

3. *Frostbite*: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. *DO NOT* squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.

4. *Treatment of frostbite*: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100°F to 106°F water bath. Water temperature will drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters.

   NOTE: Never listen to myths and folk tales about the care of frostbite. *Never* rub a frostbitten or frozen area. *Never* rub snow on a frostbitten or frozen area. Rubbing the area may cause

serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

5. *General cooling/Hypothermia*: General cooling of the body is known as systemic hypothermia. This condition is not a common problem unless workers are exposed to cold for prolonged periods of time without any shelter.

Body Temperature	°C	Symptoms
99-96	37-35.5	Intense, uncontrollable shivering
95-91	35.5-32.7	Violent shivering persists. If victim is conscious, he has difficulty speaking.
90-86	32-30	Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings.
85-81	29.4-27.2	Victim becomes irrational, loses contact with his environment, and drifts into a stuporous state. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias.
80-78	26.6-18.5	Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic
Below 78	25.5	Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death.

6. *Treatment of hypothermia*: Keep worker dry. Remove any wet clothing and replace with dry clothes, or wrap person in dry blankets. Keep person at rest. Do not allow him/her to move around. Transport the victim to a medical facility as soon as possible.

TABLE 3[1]
COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS AN EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)

Estimated wind Speed (in mph)	Actual Temperature Reading (°F)P											
	50	40	30	20	10	0	10	20	30	40	50	60
	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	15	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-146
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER in < hr with dry skin. Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute			GREAT DANGER may freeze within 30 seconds.				Flesh
	Trench foot and imersion foot may occur at any point on this chart											

Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1986, p.01.

APPENDIX D

GENERAL HEALTH AND SAFETY WORK PRACTICES

GENERAL HEALTH AND SAFETY WORK PRACTICES

1. Site personnel must attend each day's Daily Briefing and sign the attendance sheet.

2. Any individual taking prescribed drugs shall inform the FTL/SHSO of the type of medication. The FTL/SHSO will review the matter with the HSM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.

3. The personal protective equipment specified by the FTL/SHSO and/or associated procedures shall be worn by site personnel. This includes hard hats and safety glasses which must be worn in active work areas.

4. Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.

5. Personnel must follow proper decontamination procedures and shower as soon as possible upon completion of work shift.

6. Eating, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the HSM to allow fluid intake during heat stress conditions).

7. Lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.

8. Signs and demarcations shall be followed. Such signs and demarcation shall not be removed, except as authorized by the FTL/SHSO.

9. No one shall enter a permit-required confined space without a permit and appropriate training. Confined space entry permits shall be implemented as issued.

10. Personnel must follow Hot Work Permits as issued.

11. Personnel must use the Buddy System in the Exclusion Zone.

12. Personnel must follow the work-rest regimens and other practices required by the heat stress program.

13. Personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.

14. No person shall operate equipment unless trained and authorized.

15. No one may enter an excavation greater than four feet deep unless authorized by the Competent Person. Excavations must be sloped or shored properly. Safe means of access and egress from excavations must be maintained.

16. Ladders and scaffolds shall be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders or scaffolds.

17. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

18. Safety belts, harnesses and lanyards must be selected by the Supervisor. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.

19. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.

20. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.

21. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.

22. Horseplay of any kind is prohibited.

23. Possession or use of alcoholic beverages, controlled substances, or firearms on any site is forbidden.

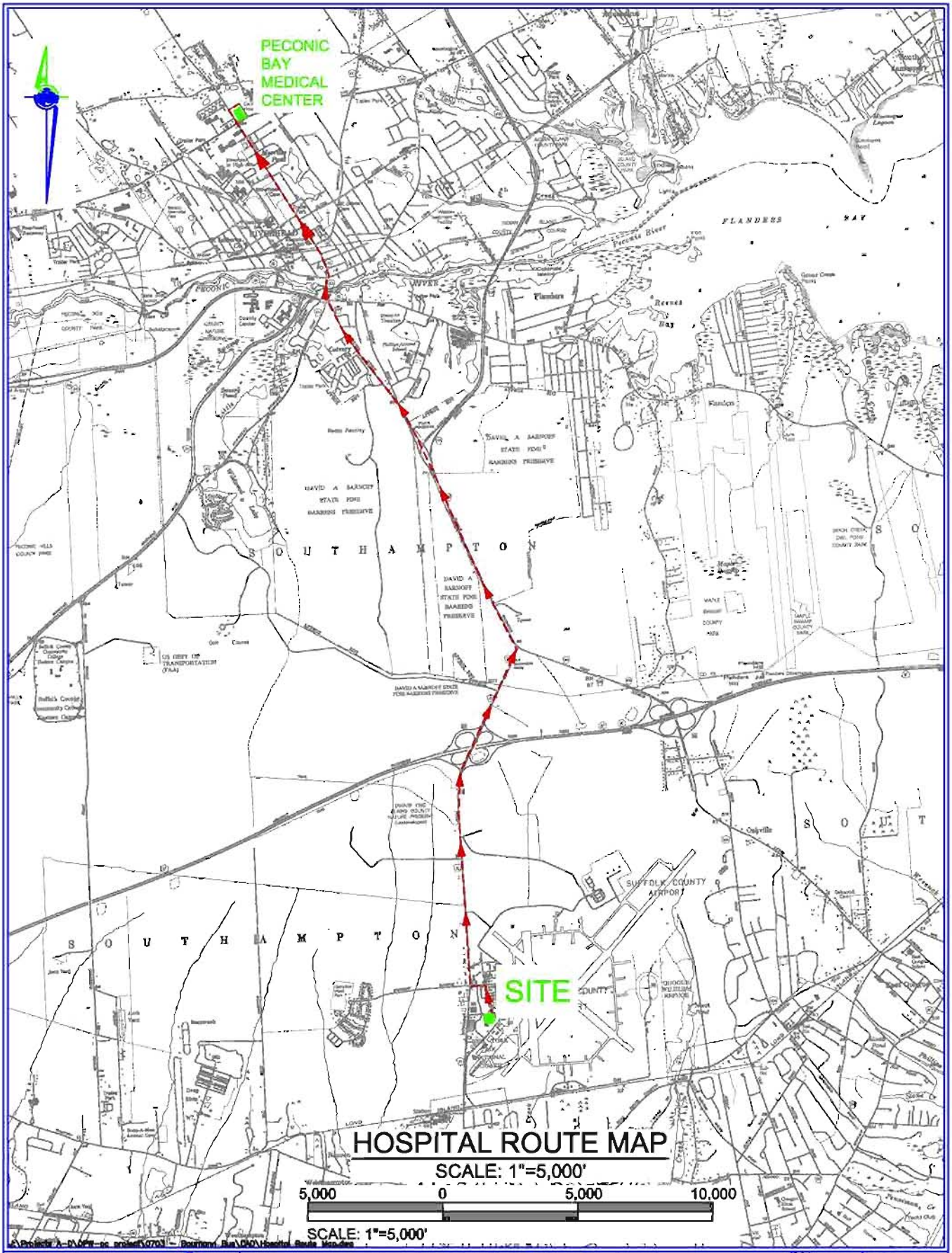
24. Incidents, no matter how minor, must be reported immediately to the Supervisor.

25. Personnel shall be familiar with the Site Emergency Response Plan, which is contained in Section 12 of the HASP.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with regulations set forth by OSHA, the client, PWGC Supervisors, and the FTL/SHSO.

APPENDIX E

HOSPITAL ROUTE MAP



HOSPITAL ROUTE MAP

SCALE: 1"=5,000'

C:\Projects A-D\DPW - pc project\0703 - Baumann Bus\DAO\Hospital Route Map.dwg

PWGC
Strategic Environmental & Engineering Solutions
630 Johnson Ave. Suite 7 Bohemia, N.Y. 11716-2618
Ph 631 589-6353 Fx 631 589-6358 E-mails: info@pwgconnect.com

FORMER BAUMANN BUS SITE
GABRESKI AIRPORT
WEST HAMPTON, NY

Project	DPW0703
Designed By	TM
Reviewed By	PWG
Drawn By	TC\LLG
Figure No.	1
Date	1/25/08

APPENDIX F

DAILY BRIEFING SIGN-IN SHEET

PWGC
Strategic Environmental Engineering Solutions

DAILY BRIEFING SIGN-IN SHEET

Date: _____ Project Name/Location: _____

Person Conducting Briefing: _____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc.)

_____

_____

_____

2. OTHER ISSUES (HASP changes, attendee comments, etc.)

_____

_____

_____

3. ATTENDEES (Print Name):

1.	21.
2.	22.
3.	23.
4.	24.
5.	25.
6.	26.
7.	27.
8.	28.
9.	29.
10.	30.
11.	31.
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17.	37.
18.	38.
19.	39.
20.	40.

APPENDIX G

INCIDENT REPORT FORM / INVESTIGATION FORM

PWGC
Strategic Environmental Engineering Solutions

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 1 OF 2			
TYPE OF INCIDENT - CHECK ALL THAT APPLY			
INJURY/ILLNESS	VEHICLE DAMAGE	PROPERTY DAMAGE	FIRE
SPILL/RELEASE	PERMIT EXCEEDENCE	NEAR MISS	OTHER
GENERAL INFORMATION			
PROJECT NAME:	DATE OF REPORT:	REPORT NO.:	
DATE OF INCIDENT:	TIME:	DAY OF WEEK:	
LOCATION OF INCIDENT:			
WEATHER CONDITIONS:	ADEQUATE LIGHTING AT SCENE? YES NO N/A		
DESCRIBE WHAT HAPPENED (STEP BY STEP - USE ADDITIONAL PAGES IF NECESSARY)			
AFFECTED EMPLOYEE INFORMATION			
NAME:	EMPLOYEE: YES NO		
HOME ADDRESS:			
SOCIAL SECURITY NO.:	HOME PHONE NO.:		
JOB CLASSIFICATION:	YEARS IN JOB CLASSIFICATION:		
HOURS WORKED ON SHIFT PRIOR TO INCIDENT:	AGE:		
DID INCIDENT RELATE TO ROUTINE TASK FOR JOB CLASSIFICATION? YES NO			
INJURY/ILLNESS INFORMATION			
NATURE OF INJURY OR ILLNESS:			
OBJECT/EQUIPMENT/SUBSTANCE CAUSING HARM:			
FIRST AID PROVIDED? YES NO			
IF YES, WHERE WAS IT GIVEN: ON-SITE OFF-SITE			
IF YES, WHO PROVIDED FIRST AID:			
WILL THE INJURY/ILLNESS RESULT IN: RESTRICTED DUTY LOST TIME UNKNOWN			

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 2 OF 2 REPORT NO.
MEDICAL TREATMENT INFORMATION
WAS MEDICAL TREATMENT PROVIDED? YES NO
IF YES, WAS MEDICAL TREATMENT PROVIDED: ON-SITE DR.'S OFFICE HOSPITAL
NAME OF PERSON(S) PROVIDING TREATMENT:
ADDRESS WHERE TREATMENT WAS PROVIDED:
TYPE OF TREATMENT:
VEHICLE AND PROPERTY DAMAGE INFORMATION
VEHICLE/PROPERTY DAMAGED:
DESCRIPTION OF DAMAGE:
SPILL AND AIR EMISSIONS INFORMATION:
SUBSTANCE SPILLED OR RELEASED: FROM WHERE: TO WHERE:
ESTIMATED QUANTITY/DURATION:
CERCLA HAZARDOUS SUBSTANCE? YES NO
REPORTABLE TO AGENCY? YES NO SPECIFY:
WRITTEN REPORT: YES NO TIME FRAME:
RESPONSE ACTION TAKEN:
PERMIT EXCEEDENCE
TYPE OF PERMIT: PERMIT #:
DATE OF EXCEEDENCE: DATE FIRST KNOWLEDGE OF EXCEEDENCE:
PERMITTED LEVEL OR CRITERIA:
EXCEEDENCE LEVEL OR CRITERIA:
REPORTABLE TO AGENCY? YES NO SPECIFY:
WRITTEN REPORT: YES NO TIME FRAME:
RESPONSE ACTION TAKEN:
NOTIFICATIONS
NAMES OF PERSONNEL NOTIFIED: DATE/TIME:
CLIENT NOTIFIED: DATE/TIME:
AGENCY NOTIFIED: DATE/TIME:
CONTACT NAME:
PERSONS PREPARING REPORT
EMPLOYEE'S NAME:(PRINT) SIGN:
SUPERVISOR'S NAME:(PRINT) SIGN:

PWGC
Strategic Environmental Engineering Solutions

INVESTIGATIVE REPORT			
DATE OF INCIDENT:	DATE OF REPORT:	REPORT NUMBER:	
INCIDENT COST: ESTIMATED: $_____	ACTUAL: $_____		
OSHA RECORDABLE(S): YES NO # RESTRICTED DAYS ____ # DAYS AWAY FROM WORK ____			
CAUSE ANALYSIS			
IMMEDIATE CAUSES - WHAT ACTIONS AND CONDITIONS CONTRIBUTED TO THIS EVENT?			
BASIC CAUSES - WHAT SPECIFIC PERSONAL OR JOB FACTORS CONTRIBUTED TO THIS EVENT?			
ACTION PLAN			
REMEDIAL ACTIONS - WHAT HAS AND OR SHOULD BE DONE TO CONTROL EACH OF THE CAUSES LISTED?			
ACTION	PERSON RESPONSIBLE	TARGET DATE	COMPLETION DATE
PERSONS PERFORMING INVESTIGATION			
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
MANAGEMENT REVIEW			
PROJECT MANAGER: (PRINT)	SIGN:	DATE:	
COMMENTS:			
H&S MANAGER: (PRINT)	SIGN:	DATE:	
COMMENTS:			

EXAMPLES OF IMMEDIATE CAUSES

Substandard Actions

1. Operating equipment without authority
2. Failure to warn
3. Failure to secure
4. Operating at improper speed
5. Making safety devices inoperable
6. Removing safety devices
7. Using defective equipment
8. Failure to use PPE properly
9. Improper loading
10. Improper placement
11. Improper lifting
12. Improper position for task
13. Servicing equipment in operation
14. Under influence of alcohol/drugs
15. Horseplay

Substandard Conditions

1. Guards or barriers
2. Protective equipment
3. Tools, equipment, or materials
4. Congestion
5. Warning system
6. Fire and explosion hazards
7. Poor housekeeping
8. Noise exposure
9. Exposure to hazardous materials
10. Extreme temperature exposure
11. Illumination
12. Ventilation
13. Visibility

EXAMPLES OF BASIC CAUSES

Personal Factors

1. Capability
2. Knowledge
3. Skill
4. Stress
5. Motivation
6. Work Standards
7. Wear and tear
8. Abuse or misuse

Job Factors

1. Supervision
2. Engineering
3. Purchasing
4. Maintenance
5. Tools/equipment

MANAGEMENT PROGRAMS FOR CONTROL OF INCIDENTS

1. Leadership and administration
2. Management training
3. Planned inspections
4. Task analysis and procedures
5. Task observation
6. Emergency preparedness
7. Organizational rules
8. Accident/incident analysis
9. Personal protective equipment
10. Health control
11. Program audits
12. Engineering controls
13. Personal communications
14. Group meetings
15. General promotion
16. Hiring and placement
17. Purchasing controls

APPENDIX F
COMMUNITY AIR MONITORING PLAN

SUFFOLK COUNTY BAUMANN BUS SITE
AIRPORT DEVELOPMENT DISTRICT
GABRESKI AIRPORT, WESTHAMPTON BEACH, NY
SITE: #V-00576-1

COMMUNITY AIR MONITORING PLAN

Submitted To:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Prepared For:

Suffolk County Department of Health Services
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Prepared By:

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PWGC Project Number: DPW0703

MAY 2008

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Regulatory Requirements 1
2.0 AIR MONITORING 2
2.1 Real-Time Monitoring 2
2.1.1 Work Area 2
2.1.2 Community Air Monitoring Requirements 2
3.0 VAPOR EMISSION RESPONSE PLAN 4
4.0 MAJOR VAPOR EMISSION RESPONSE PLAN 5
5.0 VAPOR SUPPRESSION TECHNIQUES 6
6.0 DUST SUPPRESSION TECHNIQUES 7
7.0 DATA QUALITY ASSURANCE 8
7.1 Calibration 8
7.2 Operations 8
7.3 Data Review 8
8.0 RECORDS AND REPORTING 9

TABLES

Table 1-1 Frequency and Location of Air Monitoring
Table 1-2 Real-Time Air Monitoring Action Levels

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) provides measures for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial investigation) from potential airborne contaminant releases resulting from subsurface investigation activities at the Former Baumann Bus site, Westhampton Beach, New York.

Action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air.

The primary concerns for this site are VOCs and dust particulates.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- 29 CFR 1910.120(h): This regulation specifies that air shall be monitored to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of protection for workers.

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan: This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air.

- New York State Department of Environmental Conservation (NYSDEC) Technical and Guidance Memorandum (TAGM) #4031 - Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

The following sections contain information describing the types, frequency and location of real-time monitoring.

2.1 Real-Time Monitoring

This section addresses the real-time monitoring conducted within the work area, and along the site perimeter, during intrusive activities such as drilling, excavation, product recovery, manipulation of soil piles, extraction of sheet piling, etc.

2.1.1 Work Area

The following instruments shall be used for work area monitoring:

- Photoionization Detector (PID)
- Dust Monitor

Table 1-1 presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. Table 1-2 lists the Real-Time Air Monitoring Action Levels to be used in work areas.

2.1.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air quality monitoring shall be performed at several locations around the site perimeter before investigation activities begin. Air monitoring shall be continued periodically in series during work activities.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor or equivalent. Air will be monitored for VOCs with a portable Photovac MicroTip photoionization detector (PID), or equivalent. Table 1-1 presents a breakdown of each main activity and provides the instrumentation, frequency and location of the real-time monitoring for the site. Table 1-2 lists the Real-Time Air Monitoring Action Levels to be used in work areas. Air monitoring data shall be documented in a site log book by the designated site safety officer. PWGC's site safety officer or delegate shall calibrate and maintain air monitoring instruments in accordance with manufacturer's specifications. Instruments shall be zeroed daily and checked for accuracy and a daily log shall be kept. If additional air monitoring is required, protocols shall be appended to this plan.

TABLE 1-1
FREQUENCY AND LOCATION OF AIR MONITORING

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Drilling, Test Pit Excavation	PID, Dust Monitor	Continuous in Breathing Zone (BZ) during intrusive activities or if odors become apparent, screening in the BZ every 30 minutes during non-intrusive activities

TABLE 1-2
REAL-TIME AIR MONITORING ACTION LEVELS

AIR MONITORING INSTRUMENT	MONITORING LOCATION	ACTION LEVEL	SITE ACTION	REASON
PID	Breathing Zone	0-25 ppm, non-transient	None	Exposure below established exposure limits
PID	Breathing Zone	25-100 ppm, non-transient	Don APR	Based on potential exposure to VOCs
PID	Breathing Zone	>100 ppm, non-transient	Don ASR or SCBA, Institute vapor/odor suppression measures, Notify HSM.	Increased exposure to site contaminants, potential for vapor release to public areas.
PID	Work Area Perimeter	< 5 ppm	None	Exposure below established exposure limits.
PID	Work Area Perimeter	> 5 ppm	Stop work and implement vapor release response plan until readings return to acceptable levels, Notify HSM.	Increased exposure to site contaminants, potential for vapor release to public areas
Aerosol Monitor	Work Area Perimeter	>100 but < 150 µg/m^3 for 15 minutes	Institute dust suppression measures, Notify HSM.	Work to continue if particulate concentrations remain below 150 µg/m^3
Aerosol Monitor	Work Area Perimeter	>150 µg/m^3	Don ASR or SCBA, Institute dust suppression measures, Notify HSM.	Stop work and implement dust suppression techniques until readings return to acceptable levels, Notify HSM.

3.0 VAPOR EMISSION RESPONSE PLAN

This section is excerpted from the NYSDOH guidance for Community Air Monitoring Plan - Ground Intrusive Activities.

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities shall be halted and monitoring continued. Vapor suppression measures can also be taken at this time. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- Organic vapor levels 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If organic vapor levels exceed 25 ppm at the perimeter of the work area, work activities shall be halted. When work is halted, downwind air monitoring as directed by the Site Health & Safety Officer (SHSO) shall be implemented to determine whether vapor emission may impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Response Plan Section.

4.0 MAJOR VAPOR EMISSION RESPONSE PLAN

If organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, work activities shall be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic vapor levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality shall be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source (see Section 5.0) are unsuccessful and if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect.

However, the Major Vapor Emission Response Plan shall be immediately placed in effect if organic vapor levels are greater than 10 ppm above background.

Upon activation, the following activities shall be undertaken:

1. Emergency Response Contacts, as identified in the Health & Safety Plan, shall go into effect.

2. The local police authorities shall be contacted immediately by the Health & Safety Officer and advised of the situation.

3. Frequent air monitoring shall be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Health & Safety Officer.

5.0 VAPOR SUPPRESSION TECHNIQUES

Vapor suppression techniques shall be employed when action levels warrant their use. Techniques to be implemented for control of VOCs from stockpiled soil or from the open excavation should include one or more of the following:

- cover with plastic
- cover with "clean soil"
- application of hydro-mulch material*
- limit working hours to favorable wind and temperature conditions

*This material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch can be sprayed over open excavation areas, temporary stockpile areas and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source.

6.0 DUST SUPPRESSION TECHNIQUES

Reasonable dust-suppression techniques shall be employed during work that may generate dust, such as excavation, grading, and placement of clean fill. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly covered containers; and,
- Restricting vehicle speeds to 10 mph.

Using atomizing sprays should prevent overly wet conditions, conserve water, and offer an effective means of suppressing fugitive dust. It is imperative that utilizing water for suppressing dust not create surface runoff.

7.0 DATA QUALITY ASSURANCE

7.1 Calibration

Instrument calibration shall be documented in the designated field logbook. Instruments shall be calibrated before each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

7.2 Operations

Instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment shall be maintained on-site by the FOL/HSO for reference.

7.3 Data Review

The Field Team Leader FOL/SHSO shall interpret monitoring data based on Table 1-2 and his/her professional judgment. The FOL/HSO shall review the data with the HSM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with sample documentation shall be periodically reviewed by the HSM.

8.0 RECORDS AND REPORTING

Readings shall be recorded and available for review by personnel from NYSDEC and NYSDOH. Should any of the action levels be exceeded, the NYSDEC Division of Air Resources shall be notified in writing within five (5) working days.

The notification shall include a description of the control measures implemented to prevent further exceedances.